A full

DISCOVERY OF BEES.

Treating of

The { Nature, Government, Generation & Preſervation } of the *BEE.*

With the Experiments and Improvements, ariſing from the keeping them in tranſparent Boxes, inſtead of Straw-hives.

Alſo proper Directions (to all ſuch as keep *Bees*) as well to prevent their robbing in Straw-hives, as their killing in the Collonies.

By *MOSES RUSDEN*, an Apothecary, *Bee-Maſter* to the King's moſt Excellent Majeſty.

——— *Si quid noviſti rectius iſtis*
Candidus, imperti: Si non his utere mecum.

Publiſhed by his Majeſty's eſpecial Command, and approved by the *Royal Society* at *Greſham*-Colledg.

LONDON;
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YALE

TO THE
KING'S
MOST
EXCELLENT *MAJESTY.*

May it pleaſe your Majeſty.

I Am very conſcious that ſuch as preſume to make Dedications to your Majeſty ought to treat of Subjects lofty and learned, and with a Pen eloquent and ſubtile. But although the Subject of this ſmall Offering be mean and the Stile be Humble. Yet, it ſpeaks knowingly and by experience, of Kings, and Chieftains; of War, and Peace; of Obedience

and Subjection, of Government and Discipline, of Ingenuity and Labour, and the good effects arising from them: and shews how necessary they are, even in this little well form'd Commonwealth of the Bees; whose Being, and Prosperity depend upon their Prince, and common Parent. Fathers being the first Rulers, Lawgivers and Monarchs, before Families did swell into a larger Kingdom Since therefore Nature will herein be made appear to be the Favourer and Founder of Monarchy; and that such ingenious, laborious and profitable Creatures do voluntarily and constantly betake themselves to that Government, I do most humbly beseech your Majesties gracious Patronage and Protection, whilest I demonstrate and vindicate this Truth, by the perpetual practice of the Bees: Which may haply have some influence upon such as look with a malicious Eye upon Kingly Government, as being the effect of necessity and force, and not

of

of a natural inclination, and of choice ; I make it my prayer that all your Majeſties Subjects may be as loyal to your Majeſty, as conformable to your laws, and as beneficial to the Publick, as theſe little People are to their Soveraign, to their cuſtoms, and their republick, in which they moſt examplarily labour and obey. And I humbly implore your Majeſty to accept graciouſly this grain of Incence offered with much devotion by

Your Majeſties

Moſt Loyal and moſt Obedient

Subject and Servant

Moſes Ruſden.

TO

TO THE ROYAL SOCIETY AT *Greſham* Colledge.

ALthough the lowneſs of my Condition, and my Fortunes hath not permitted me to preſent Studies deep or difficult; and that I know my ſelf too well, to affect or aim at the being in the form of Philoſophers or Polititians: yet I may perhaps without preſumption pretend ſomething to both, though afar off, and at a mannerly diſtance, without the cenſure of vanity. Whileſt I entertain my ſelf and others with the humbleſt Subject that can well admit ſo many and ſo uſeful Obſervations as have from thence ariſen to me, and men of the greateſt Conſideration.

The wiſe man directs to the Piſmire

mire for inſtruction ; I have the advantage of propoſing a preſident much more exemplary, and more deſerving our imitation; for, this better inſpired Inſect,the Bee; being it ſelf untaught, gives us variety of Leſſons not unworthy, in many things, of Princes and of States-men, of good Subjects, and ſuch as would grow rich, and proſper. And, even the moſt eminent Philoſophers, that pry with the moſt penetrating Eyes and Imaginations into the ſecrets of Nature, have with much ſtudy and amazement contemplated the Bees, whom they have found to be as Buſy, Forcible, Curious, and Remarkeable as in any of her greater works, which attract more of our admiration, and enquiry, my deſign is not to diſpute peremptorily, with *Ariſtotle*, *Pliny*, or other my learned Maſters, who have elaborately con-

ſidered and diſcourſed of the nature of Bees, and their faculties; although I may upon new and plain diſcoveries ſometimes deviate from them. Nor ſhall I with *Virgil*, deſcribe with Fancy, and fine invention theſe little people, which are indeed worthy to be celebrated by ſo excellent a Poet: My buſineſs, by the good helps I have had, is to ſhew Nature, and Truth naked, and unadorn'd, with Metaphors or ſuppoſitions; for I would be conſidered only as a Traveller who hath carefully, ſtudiouſly, and faithfully viſited and examined other Nations, to bring home to publick uſe, & information, the obſervations he hath made, of their living and ſubſiſting, their Laws & Government, their Arts and Manufactures, and the ſtrengths, and poilicies by which they preſerve themſelves upon all occaſions, I have therefore with much ſinceriy

cerity laid before you what I have collected from Authors of the higheſt degree, as well as more modern writers, and what my Eye hath ſeen, my experience proved, and certain my knowledge can, and hath demonſtrated, and will therefore hope that you (who are the greateſt Judges I can appeal to, where Art or Nature are concerned) will find reaſon, upon farther examination, to recommend as things uſeful, true, or ſtrongly probable at leaſt, the farther Diſcoveries I have made; or have brought to a clearer light what hath been more obſcurely, or uncertainly gueſs'd at, or treated on by others, whileſt I manifeſtly ſhew how Bees may be beſt underſtood, enjoied, and preſerv'd alive, to the benefit of cruel and ungrateful Mankind, who hitherto, like the worſt of Robbers, hath ſpoyled them at

once

once of their lives and treaſures. And although they ſeem indeed but as it were ſo many Flies playing in the Sun, or among the Flowers of the Field. Yet, if we ſhall vouchſafe to conſider them, as we do our ſelves making boaſt of our Reaſon (which as it is abuſed by us, is as much our condemnation, as our Prerogative) and of our greater Bulks, and Dominion man hath above theſe minute Creatures; it may be well confeſs'd that the Divine Providence hath not in any part of its high and miſterious operations called for our wonder more than in the contrivance, the councel, and the ſignal aſſiſtance, it imparts to theſe little Societies of Bees, who as well as the proudeſt, or the greateſt Giants of the Creation may brag that *Eſt Deus in Nobis*; and who by that Divine and Extraordinary impulſion (without

out experience, or inſtructions derived from their ſhort lived Anceſtors, whom they could never know) do evidently, and as it were by a well applied Rule, and by an inſtinct leſs erronious than that Reaſon it ſelf which oftentimes miſguides us; and by laws more ſteady and inviolable than thoſe of the *Medes* and *Perſians*, ſubſiſt, and govern, with Prudence, Foreſight, Courage, Oeconomy, Fidelity, Regard to Intereſt, and all thoſe Offices and Virtues, which mankind hath at any time arrived to for the preſervation of it ſelf, and of Humane Society. And the more to aſſimulate them to mankind, we ſhall diſcern as in an Epitome, the Vices, and the Paſſions, the Envie, the Robberies, and the Murthers, which the ambitious, the Idle and the Depraved do practice upon the Earth. And, we ſhall now

find

find their qualities, and their works, better diſcovered, and demonſtrated, by the tranſparant Hives firſt ſhewed to us by Dr. *Wilkins*, late Biſhop of *Cheſter*, a moſt Eminent Member of your Society, which have ſince received ſeveral variations and improvements by one *Geddie*, and ſince by my ſelf, with ſuch informations and inſtructions, as I have found neceſſary for the rendering them more practicable, and uſeful. So that every perſon may either gather Honey, or pleaſant Obſervations from theſe intelligent Creatures; who deſerve well from all, eſpecially from thoſe who may pretend to Virtue and Knowledge, among whom you are Princes. And I therefore.

Your moſt devoted.

M. R.

THE PREEACE TO THE READER.

Courteous Reader,

BEes are of ſuch ſtrange natures, and liable to ſo many accidents, that unleſs a man be very wary and circumſpect, he ſhall reap but little profit or advantage by them. Which is the cauſe, that there are ſo many proverbs relating to Bees. For as a man having loſt his right way in a Foreſt or Wood, meets with many waies or paths, but ſeldom hits upon the right; ſo moſt of thoſe who have written any thing now extant concerning Bees, (not knowing the right way & manner of their Government and Breeding) have run into many errors and by-paths of ignorance, ſeldom (yet ſometimes) hitting right concerning ſome things of their nature in generall, which uncertainty in moſt writers, hath cauſed many falſe proverbial

bial ſayings relating to them, viz. *That Bees are lucky to ſome perſons, and will thrive with them; but unlucky to others and will not thrive with them. That they muſt be bought with Gold, or Corne, or elſe muſt be given, or found; otherwiſe (forſooth) they can by no means be ſuppoſed to thrive. And that they are unlucky to be carried by water, and muſt be removed ſouthward, and many other ſuch like ridiculous ſtories, not worthy the mentioning. When the true and only reaſon why Bees thrive not with every man alike, is either the want of judgment or care, or both, in thoſe who look after them; as appeareth by this proverbial inſtance, that when the owners of the Bees dies, then the Bees alſo (as if they had a Sympathy with their owners) will die ſoon after; which I have known, ſeemingly verified, by ſome ancient perſons who kept Bees, had skill, and looked well after them whilſt they lived, but they dying, the greater part of their Bees within one year after have died alſo, which happened not becauſe the owners died, but becauſe the skill and care of the Bees died with thoſe owners.*

The

The conſideration of this great diſadvantage to my country; and that Bees may thrive with all thoſe who are ingeniouſly concerned as to profit and pleaſure by them, induced me to publiſh this treatiſe, of the Natures, Government, and Generation of Bees, and the right way of ordering them in Colonies; that my countrymen by this diſcovery may know not only the cauſes of their Bees miſcarrying to their own loſs, but alſo how to prevent, as well the miſcarriages of Bees, as the cruelty exerciſed upon them, by killing them when their Honey is taken away: Yet ſo many accidents attend them, and ſo much difference is in their ſtrength one Stock from another, and in the ſoyl neer which they ſtand, and in the places they ſtand in, beſides the uncertainty of the weather in England; *that almoſt no general rules can be ſet down for directions, but may in ſome ſort, and at ſome times and places, admit of ſome exceptions and ſmall alterations; therefore circumſpection muſt be uſed, until experience ſhews you how to order Bees rightly.*

The cauſe of my following this method of keeping Bees in Colonies, at firſt was

my

my love to the Bees themſelves, and the hatred of that cruelty exerciſed on thoſe poor induſtrious creeatres, (ſo wiſely providing for their own future livelyhood,) which is ſo like the method of the Devil, that pays his moſt induſtrious ſervants with the greateſt ruine: And finding by my own experience, though others in ſome places miſcarried, that the cauſes were their miſmanagement, and miſtakes, by reaſon their Box-Hives and their Bee Houſes were not made by any pattern, or elſe by ſome falſe pattern, and not through any defect in the Art it ſelf: And alſo finding my Bees in ſeveral countries to thrive very well, and anſwer my expectations in their profit, ſomething of which I ſhall mention in the laſt chapter of this Book. I therefore thought it neceſſary, and a duty, which I owe to my Country, to diſcover to all that delight in Bees, thoſe experiences which I have obtained in ſo delightful and profitable a method.

And in order thereunto, for the incouragement and inſtruction of all thoſe who ſhall deſire it, I ſhall be ready whilſt I live to impart unto them any directions needful from time to time, when

when they come or ſend to me. And if any Perſon of Quality or Gentleman deſire it, I ſhall be ready to come to their Houſes, to aſſiſt and direct them in this method of improving Bees.

And I doubt not but with the due obſervance of the Directions this Book will afford, and ſome ſmall Attendance, any Man may receive, not only good Profit from them, (without the Deſtruction of ſuch induſtrious Servants) but alſo much Delight and Pleaſure in beholding from time to time their curious Works.

This I thought good to premiſe to the Candid Reader, whoſe Profit and Delight is by this Book intended; which if he reap, let him give God the Glory, in beholding his wonderful Works in theſe ſo ſmall and admirable Creatures, and paſs a favourable Interpretation upon the Endeavours of,

His Country's hearty well-willer,

Moſes Ruſden.

Advertiſement.

THat his Majeſty hath given and granted by Letters Patents under the Great Seal of *England*, to *John Gedde*, and his Partners, the full and ſole Power, Priviledg, and Authority of uſing, practiſing, exerciſing, and enjoying the new Art and Invention for the Improvement of Bees, during the ſpace of fourteen Years, according to the Statute made in that behalf; barring and excluding all others whatſoever from

from making, uſing, practiſing, counterfeiting, imitating, or reſembling, the ſame, without the ſpecial licence, and conſent of the ſaid *John Gedde* and his partners, firſt had and obtained, under the penalties in the ſaid ſtatute contained.

All perſons that deſire to ſet up this method may be pleaſed to take notice, that they may be furniſhed with Box-Hives, and Colonies ready made, inſtructions, and licences, and the ſight of ſeveral Bee-Houſes, and Colonies improved in this way, by the Author, an Apothecary, at his Houſe in the Bowling-ally aforeſaid, who is authoriſed and impowered by the ſaid *John Gedde*, and his partners, to give forth licences, *&c.*

And if any Perſon of Honour or Gentleman ſhall think amiſs of my Aſſertions in this Book, or any of them,

them, I offer my ſelf to prove the ſame, by cleer argument in anſwer to objections if deſired, or by operation, if they will be at the coſt.

THE

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Section 1.

Of the Natures and Properties of Bees.

CHAP. I.

Of a Colony of Bees.

A Colony of Bees is properly a Swarm coming forth of a Stock; which Stock being full, hath not room to contain thoſe great numbers of Young which are produced in the Spring, and conſequently they go forth in a Swarm, and ſo live by themſelves, ſeparate from the Stock, whereby they become another Kingdom.

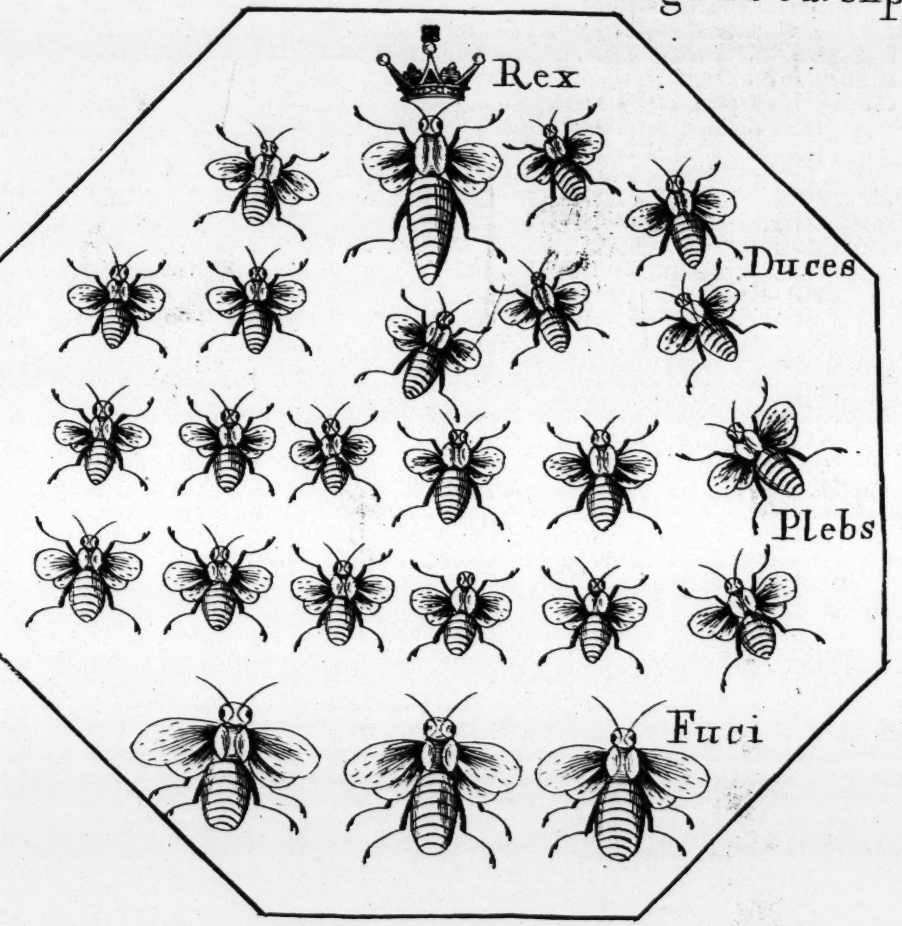
Now the keeping of Bees in Box-hives, I call by the name of Colonies, to distinguish them from those kept only in Straw-hives; because all those young broods which are bred in the Spring, have room made for them, by the addition of another Box-hive, whereby they continue their labour without intermission, by working in those additional Box-hives, instead of swarming; so that thereby all the labours of all the Bees, as well young as old, are united in one Colony.

Every Colony, Swarm, or Stock of Bees consisteth of several Bees, all of one genus, which for distinction may be divided into three several sorts of Bees, *viz.* a King-Bee, a common Honey-Bee, and a Drone-Bee; which may be compared to three sorts of Dogs for their different shapes; thus: the King-Bee to a most stately Buck Gray-hound; the common Bee to a little fierce Bull-Dogg; and the Drone-Bee to a great Mastiff-Dogg; of which in their order.

CHAP. II.

Of the King-Bee.

THE Royal Race of King-Bees, being natural Kings; one of them equals the value and worth of all the rest: therefore as the most worthy, I shall here describe the King-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King-Bee, as the firſt ſort of Bees.

The King is a fair and ſtately Bee, having a majeſtick gate and aſpect, being almoſt an Inch in length, ſomewhat longer than a Drone, yet not ſo big ſave only in the upper part of his third diviſion; he is almoſt as long again as a common Honey-Bee; his tongue is but half the length of a common Honey-Bee's, and his fangs are ſhorter than theirs are; for they with their long tongues gather Honey, and with their fangs, wax, *&c.* which nature ſeemeth in part to have denyed him, as having no need to uſe either (as they do) being to be maintained as other Princes are.

His wings are of the ſize of the common Bees, which ſeem very ſhort, becauſe of the length of his body; for they ſcarce reach to the middle of his nether part, his leggs are longer and ſtronger than the common Bees: his hinder, or nether part, is longer almoſt by half than his foreparts; and his end, or tail, more peaked than any other Bees, in the point of which peaked end is his ſting, and under his ſting is his place for the evacuation of excrement.

His colonr is a brighter brown than any other Bee's, until he is above a year old, and then he grows blacker: his belly is of a ſad yellow, deeper than gold: his nether part hath four partitions ſeparated by lines going over croſs his belly, which lines are of a golden colour, being of a brighter yellow than the reſt of his belly is: his thighs, or hinder leggs, are near the colour of his belly: moreover,

ſome of them have a ſpot on their forehead while young, which ſoon wears away.

The King-Bee hath a ſting, which though not ſo large, nor ſo long, yet is more acute than the ſting of any common Bee, and he hath alſo a better command of it than they have; for when he uſeth his ſting, he doth not leave it behind him, as they do, but he uſes it ſeldom, being armed with Majeſty, his Subjects valour, and willing obedience. I have had about twenty King-Bees in my hands this laſt year, and could provoke but two of them to put forth their ſtings, unleſs they were hurt.

Alſo the Male among Waſps, which ſome call the Mother-Waſp, ſtings more venemouſly than the common Waſp doth.

Concerning the King-Bees, I think it will not be amiſs here to recite what *Pliny* hath written of them in his Natural Hiſtory, *lib.* 11. *cap.* 16. *Omnibus forma ſemper egregia, & duplo quàm cereris major, pennæ breviores, crura recta, ingeſſus celſior, in fronte macula quodam diademate candicans: multum etiam nitore a vulgo differunt*: That is, they are all of a more excellent form, and greater by half than the reſt, ſhorter wings, ſtraight thighs, ſtatelier in their gate, a certain ſpot in their forehead, in the ſhape of a Crown, and they differ much from the vulgar Bees in point of their brightneſs. The King-Bee commands and orders all, as I ſhall ſhew, when I come to the Government of Bees.

There is of this ſort one in every Colony or, Stock

Stock of Bees, and but one from the end of *July*, or beginning of *Auguſt*, until the *April* enſuing, and then young Princes are bred, and kept all the Summer in order to ſwarm, and ſupply the place of the old King in caſe of mortality.

CHAP. III.

Of the common Honey-Bee.

THE ſecond ſort of Bees are the common Honey-Bees, which I thus deſcribe. The common Honey-Bee is a flying Inſect, having four wings, and ſix leggs; in ſhape oblong and little, in colour brown, having three partitions on his belly, with ſilver-coloured lines going croſs; his eyes are oblong and covered with a Horny membrane, or tunicle, of a ſhining black like jet, and immoveable, being placed on the out-ſide of his cheeks, or rather are inſtead of cheeks; he hath two horns pliable and bending, with two joynts, one cloſe to his forehead, the other in the middle; he hath two fangs in faſhion of a pair of pincers, which hang not one over another, but ſidewaies one againſt another; his tongue is ſo long, that his mouth contains it not, and he doubles it, and puts it between his fangs, under his chin and neck; his tongue is divided into three parts, whereof the two outmoſt are as a caſe for the third,

which is longeſt, and moſt uſed; his tail is ſomewhat ſharp, within which is his ſting faſt joyned to his entrails, under which he hath a place for the evacuation of excrement, which he doth moſt commonly flying, and that is the cauſe (if cloths in drying are ſpread on the ground near them, in the Spring when they firſt fly abroad, or in a fair Sun-ſhiny day in Winter) they do ſtain the cloths with their excrement.

The common Bees being divided into bands, have their ſeveral Leaders and Officers, which, according to their Kings orders, do their work by turns, ſome watching, others killing their Drones, whilſt others are cleanſing their Hive, and others abroad; all working for the benefit of the whole; and thus they all work as long as they live, and the older they grow, the blacker they are; ſo that by their colour you may diſtinguiſh, which Bees are a year or two old, from thoſe which are younger, as well as by their ragged wings.

The Bees have all their parts for ſeveral uſes; their eyes to ſee, their horns to feel, being guided by their touching, eſpecially in the dark Hive; their two fangs in manner of pincers, being their ſtrongeſt parts to gather generative matter from vegetables, which they faſten on their thighs, or hinder leggs as they gather it; (by generative matter, I mean, an organizable or animable matter extracted by the Honey-Bees from Trees, Plants, Flowers, *&c.* and by them put into their proper Cells or Matrixes, which being there duly

duly mixed and invigorated with the ſperm of the King-Bee (in which ſperm I conceive the plaſtick power and energy for production of young Bees doth reſide) hath ſuch an alimentary quality as is adapted by Nature to ſupply nouriſhment to the grubs in order to their augmentation, as the white and yolk of the Egg is to the *cicutricula* for the production of a Chick by the gentle and mild heat of the Hens incubation. Alſo with their fangs they bite and kill their Drones; with their leggs they crawl; with their wings they fly; and with their ſtings they defend themſelves from, and offend, their ſtrongeſt enemies.

CHAP. IV.

Of the Drone Bee.

THE third ſort of Bees are the Drones, which are the largeſt Bees in an Hive, having eyes, head, wings, body and leggs all proportionable to their magnitude, and two moveable wreathed horns growing out together between their eyes, but extending like a fork; their tails are obtuſe and large at the end; their colour brown; they have neither ſtings nor fangs, which is the reaſon they are ſo eaſily beaten and killed by the Honey-Bees, having no weapons offenſive or defenſive.

They are of ſuch uſe in the Hive for hatch-

ing the young brood in the Summer time, eſpecially when honey-dews fall, that no Colony or Stock can well thrive without them; for they are as Servants or Nurſes under the Honey-Bees, to help hatch up the young brood, whilſt the other are abroad at their labours; as I ſhall further ſhew when I come to the generation of Bees; and their bodies being large, they cover the more room with the ſmaller numbers.

CHAP. V.

Of their Properties in general.

TO ſpeak ſomething of their Properties, Bees are creatures full of wonders, being not altogether tame, nor abſolutely wild, but between both, yet indocible, for moſt they do is by inſtinct; and although there do not appear thoſe outward organs of the ſenſes which other Animals have; neither is ſeen in their heads that inward principal part, the brain, which is the fountain and ſeat of the internal ſenſes, *viz.* common ſenſe, phantaſy, and memory; yet have they the ſenſes themſelves both outward and inward, which their ſubtle and active ſpirits do excite and quicken; ſo that as the Honey in the Honey-comb, excells all other things in ſweetneſs, ſo do the Bees themſelves excell all other creatures (in

things

things relating to themſelves) in Art, Wiſdom, or Foreſight, Induſtry, Valour and Loyalty, having alſo the perfect uſe of the five external ſenſes, as ſeeing, hearing, feeling, ſmelling and taſting: their excellencie in one thing or other, is ſhewed in almoſt every part of this Book; yet here, in the next Chapters, I ſhall give you a taſt of my reaſons and experience, that theſe excellencies are in them, and that they exerciſe them.

CHAP. VI.

Of their Art, Wiſdom, or Foreſight.

AS for their Art: a Bee, the firſt day of his flying abroad is an exquiſite Chymiſt, extracting from herbs and flowers, and other things, honey, wax, generative matter, and what elſe they want: to do the leaſt part of which would require time in men to ſtudy and practiſe.

Their Art appears further in their excellent Architecture, which is by the framing of their ſeveral Combs, and hexagonical Cells, ſo mathematically exact, that the bottom of each Cell of one ſide, hath its foundation upon three lines of three Cells on the other ſide, meeting all in one angle right in the middle of the oppoſite bottom, by which the ſtrength as well as the beauty of the ſame is much augmented.

As

As for their Wiſdom and Foreſight; a ſure teſtimony of it is, that it is natural for all thoſe Bees that are bred in Summer, ſo to foreſee and know that a Winter will come, as wiſely to conſider it, and therefore do they ſo earneſtly provide for ſubſiſtence before it does come; which we can hardly learn our children in thirty years, if then.

Alſo their foreſight of a ſtorm approaching, makes them haſten home, although but half laden, to ſecure their own lives.

CHAP. VII.

Of their Induſtry, Valour and Loyalty.

AS for their admirable Induſtry, that appears by the indefatigable pains they take for the good of the Common-wealth; none of them for age deſiring a Writ of Eaſe, but being all volunteers in all the ſorts of their labours, ſome of them I think it not improper to mention; for, beſides their gathering of honey, wax, and generative matter, and building their combs, they have ſeveral other buſineſſes, *viz.* where occaſion is, ſome breaking down pieces of rotten combs for repairs, others carrying out their dead, others haling out abortives, others cleanſing out filth, others being upon the guard to keep off Robbers and Strangers, in this form; placing themſelves in five or ſix files,

eight

eight or ten deep upon the floor of the Hive, ſo that all the Bees paſs between them, whereby no ſtranger can paſs them but is ſeized on, and brought to condign puniſhment; others of them ſubmitting themſelves into the uſe of bridges and ladders for the reſt to paſs from place to place upon, where there wants a conveniency in the Hive; thus; ſingle Bees linking themſelves to one another the length of ſix or ſeven inches, and enduring for a conſiderable time in this form, the abundant trampling of paſſengers.

As for their Valour; therein they ſurpaſs all creatures, I ſhall here mention but one inſtance: for a ſingle Bee near his Hive, if a man do but affront him, ſhall purſue him, though he were in the midſt of an Army, and not leave him for all the terrors of gun-ſhot, though whole vollies were diſcharged againſt him, and though he be ſtricken down to the ground ſeveral times, yet he ſhall not quit his purſuit, till killed or diſabled.

As for their Loyalty; no diſtaſte from their Prince, or hardſhip endured, can make them quit their Love and Loyalty to him, as I ſhall further make it appear in treating of their Government.

CHAP.

CHAP. VIII.

Of the five Sences in Bees.

AS for their uſe of the five exterior Senſes: That they ſee, I think none doubts, becauſe they take notice of their new dwelling, by flying about it; and going remote from home, at their return they can hit the little hole of their entrance.

Their Hearing alſo is as perfect as any other Senſe; for they hear the voice of their King-Bee upon all occaſions, and the ſeveral ſignal notes for preparing to ſwarm, otherwiſe what means the ringing of pans to ſtop a Swarm from flying away? but to confound their hearing of their Leaders voices and notes.

Alſo by their ſeveral notes and hummings, the Bees give notice to one another when their King is abſent, and when he returns again: inſomuch that when I have kept their King ſome ſpace of time from them, though the numbers of half a ſwarm were abroad in ſearch after him, yet upon hearing that joy which the Bees at the door expreſſed by their notes when I put their King to them again, all thoſe Bees flying about in ſearch after their King, immediately returned home at once, to the admiration of many beholders; for I have done it oftentimes, in ſeveral places.

Their

Their Feeling is very ſubtle; for, in the dark Hive they are guided by their little weak horns, and at their touch of them againſt any thing they will give back; but if ſome doubt and will not believe that Bees feel, I counſel them to put their hands into an Hive full of Bees, and ſo they may be feelingly reſolved of their doubt whether Bees feel or not, for (if I miſtake not) the Bees will feel their hands to ſting them; but put a dead thing among them, though they feel it, yet will they not ſting it.

Their Smelling is very quick, even to a proverb; for if one Bee is killed near the Hive, the others are by the ſcent of him cruſhed, made ſo angry, as to ſeek revenge; and this I have often experienced; ſo that when I have accidentally killed a Bee, I have been forced to go away until the ſcent was over, to avoid the anger of the reſt.

They ſcent an Honey-dew preſently, which draws them almoſt all out of the Hive to follow their work, which they do whilſt it laſteth, with greater earneſtneſs, than men work in the time of Harveſt.

Alſo by this ſenſe only, they know robbing Bees in their Hives, and diſtinguiſh their friends from their foes, when great numbers are fighting together.

Their Taſting muſt needs appear, when we conſider that they could not otherwiſe diſtinguiſh different Taſts: for nothing ſo much delights their curious pallats as the moſt luſcious things.

To

To conclude this Section: All these excellencies and more, are in them, which might be made more evident by abler persons, if in studying of Nature, they would also study the Natures of these little, yet wonderful creatures: However, you will find in this Book, here and there as occasion offereth further proofs of what I have written.

The Bee excelling in many qualities, verifies some proverbs of him as followeth.

As { Profitable, Laborious, Loyal, Swift, Nimble, Quick of Scent, Neat } as a Bee.

These wonderful parts and properties of this little creature, are so many evident proofs of the Infinite Wisdom and Power of the Creator, as was well observed by *Du Bartas* in his Works on the Creation of the fifth day; thus:

For, if old times admir'd Callicrates
For Ivory Emmets, and Myrmecides
For framing of a rigged Ship ſo ſmall,
That with his wings a Bee could hide it all:
Admire we then th' All-wiſe Omnipotence,
Which doth within ſo narrow ſpace diſpence
So ſtiff a Sting, ſo ſtout and valiant heart,
So loud a Voice, ſo prudent Wit and Art:
Their well rul'd State, my ſoul ſo much admires,
That durſt I looſe the reins of my deſires,
I gladly could digreſs from my deſign
To ſing a while, their ſacred Diſcipline.

Of which Diſcipline I am next to diſcourſe,

Section

Section 2.

Of the Government of Bees.

CHAP. I.

Of their Government in general.

THE Bees enjoy a peaceable and quiet State, under one Monarch; ſo that every Colony and Stock of Bees is, within its ſelf a particular Kingdom, having one only King to whom they all yield obedience, maintenance, and defence: For when they have no King, they pine away and die: and under two or more Kings, they will not be; for (as if they knew by inſtinct) that they cannot ſerve and obey two Kings at once (as no man can ſerve two Maſters) ſo they will neither work, nor breed, nor be quiet, until all the reſt (when by acceſſion of two or three Swarms together, more Kings are among them) are depoſed, by that King who ſits on the Throne: for, as was well obſerved by Mr. *Butler*, page 5. of his Book of Bees, *The Bees abhor as well Polyarchy as Anarchy, God having ſhowed in them unto men, an expreſs pattern of* A perfect Mo-

narchy

narchy the moſt natural and abſolute Form of Government.

The Ægyptians, by the Hieroglyphick of a Bee, ſignified a King. Without doubt, they could not fitly reſemble the Majeſty of a King ſo well by any other creature, as by the King of the Bees, who is a natural King, and ſet apart by Nature her ſelf for that very end. For, thoſe we call the Kings of Beaſts, and Fowls: The Lion, and the Eagle, have no Subjects but what are in rebellion, becauſe they do not protect, but devour them. But the King-Bee, though the moſt abſolute Monarch, yet is attended with all the Love and Loyalty imaginable from his people, becauſe he devoureth none, but is a cheriſher of, and benefactor to all.

Alſo his place of abode makes the Court; for, where he is, whether within or without the Hive, ſuch a retinue of Bees alwaies attends him, as may be ſuppoſed to wait on him. But in all exigencies and diſturbances they have greater recourſe to him than ordinary, flocking about him as well to defend him in caſe of danger, as to receive his orders, as Souldiers and Officers to their King, or General.

CHAP. II.

Of the Bees neceſsity of a King.

THat Bees muſt of neceſſity live under a King is apparent: for without a King they will either die, or yield to their enemies the robbers.

They pine away and die; becauſe they cannot breed, as I ſhall ſhew when I come to the generation of Bees. And they will in few daies yield to the robbers for want of a King to order their battels, for inſtances thus: both in ſwarms, and ſtocks.

A Swarm, though ſetled and hived, yet if their King Bee happens to miſcarry and ſo not come to them (as it ſometimes falls out) then having no King they will never ſtay in the Hive, but go all out, and return home again: and ſometimes they return home again without ſetling any where (that is) as oft as they miſs their King ſo ſoon; which is the cheif, if not the only cauſe that Swarms ſo often return home again after they are ſwarmed.

A Stock or Colony, when their King dies, or happens by any accident to be loſt, unleſs there be a ſucceſſor in the Hive of the Royal iſſue of King-Bees, the whole Stock or Kingdom will certainly periſh, either by pining away if dead, and loſing themſelves in ſearching after

after him if loſt, or elſe by yielding to the robbers.

That they pine away & loſe themſelves, thoſe who keep Bees do ſometimes experience: when they find a rich ſtock well filled with hony, abandoned by the Bees, ſo that ſcarce one is left in the hive, though in the fall it was left full of Bees; which happens no other way but by the loſs of their King: for otherwiſe the Bees never leave that ſtore; which to obtain they have beſtowed ſo great labour and diligence, for if they had died with cold, the Bees would have remained ſtill in the hive, though dead, and in the ſame form and place they kept when alive.

That they yield to the robbers appears thus: if after the loſs of their King they do not all within a while loſe themſelves, yet in their languiſhing condition, as ſoon as the robbers come in great numbers to attach them, they will eaſily yield both themſelves and ſubſtance to them, the conſequence of which will be, that they will help the robbers in carrying away their own ſubſtance to their liyss, and ſo live with them, under their King, this, occaſioned *Virgil* in his Georgicks *lib.* 4. to write of them as followeth.

Præterea, Regem non ſic ægyptus, et ingens
Lydia, nec populi parthorum, aut medus Hydaſpes
Obſervant: Rege incolumi mens omnibus una eſt,
Amiſſo, rupere fidem: conſtructa que mella
Diripuere ipſa: et crates ſolvere favorum,

Ille operum cuſtos, illum admirantur: et omnes
Circumſtant fremitu denſo, ſtipantque frequentes,
Et ſæpe attollunt humeris, et corpora bello
Objectant, pulchramque petunt per vulnera mor-
(tem.

Which for ſome ſatisfaction to thoſe who underſtand not the Latine Tongue, there being many ſuch who keep Bees, I have thus tranſlated.

Not *Ægypt*, *Lydia*, nor *Hydaſpes* pay, (they:
Nor *Parths*, ſuch worſhip to their Kings as
The King b'ing ſafe, in all things they agree,
But he b'ing loſt, they ſeem to mutinee,
In which themſelves do bring by this confuſion,
Their food and fabricks to a diſſolution,
Him, being their preſerver, all admire,
And ſtrongly guard his perſon; then retire
To bear him on their ſhoulders, and in wars
Their bodies they expoſe, not fearing ſcars,
Only their King to ſave, they alwaies do
In his defence, their ſweeteſt lives forego.

Under this Monarch each Subject hath a publick ſpirit, for each worketh, watcheth, and fighteth, for the good of their King and commonwealth, and without any private reſpect, ſharing equally in all their accommodations; and though they freely act in all their undertakings, yet they do all in ſubordination to their King, and with reference to the publick.

CHAP

CHAP. II.

Of their Government in particular.

THeir Government is in the perſon of the King, from whom all the Bees *pro tempore*, *i. e.* for the preſent time receive their orders, as well the Captaines and Officers among them, as the commonalty.

His Government is ſevere, juſt, and abſolute, ſevere, like that of the Grand Seignior towards the race of the blood Royal, for, as ſoon as ſwarming time is fully paſt, all the younger Princes being kept in their private places which are uſually neer thoſe pavillions in which they are bred, being in the lower parts of the Hive, are expelled or executed by the Kings orders then ſitting in his Throne; the reaſon of which ſeverity is the ſame with that of the aforeſaid Grand Seignior, leſt ſome of the Royal Iſſue expecting to raign (and ſwarming being prevented by the approching winter) diſpaires of having Government, and ſo uſurpe the Throne of the rightful King.

And as nature ſeeks ſelf preſervation, ſo knowing that otherwiſe they muſt die at home, ſometimes three or four Princes do go out in a ſecond ſwarm, each of the younger being thereby in hopes not only to eſcape with life but alſo to get a Kingdom, and

then he of them, who first can get into the Throne of the new Kingdom, preserveth his own life, with the death of all the rest.

His Government is just; because he oppresseth none; the consequence of which is, unity throughout the whole Kingdom.

His Government is absolute, because his orders are never disputed but obeyed, as well in swarming, and executing their Drones, and young Princes, as in watching, and working; as followeth.

CHAP. IIII.

Of the Obedience of Bees to their King.

THE willing and cheerful obedience of Bees to their King and his orders, is manifest, because without him they work not, and because they can have no orders without a governour, and no governour but a King, therefore it must of necessity follow that they do obey his orders when they work or do any thing in the Hive: for unless they had orders for each several work they do, how could they distinguish their several works without confusion? *viz.* Some killing their Drones only, some burying their dead, others cleansing filth others only on their guard, and others hatching the young brood, whilst others are abroad at work, some gathering matter for

for generation, others fetching in water, whilſt others are gathering wax or hony: what elſe can this exact order in all their actions, and that they do not all the ſame works together, argue? but their abſolute obedience, each band following his own appointed work till it be finiſhed, and not intermedling with the work of another band, but only in diſturbances by noiſe or otherwiſe, or acceſs of ſtrange Bees in great numbers, and in caſe of Hony-dews, for then they leave off all other employments to fetch in hony: that being the general work to which all the other tend, their own inſtinct alſo joyning with their Kings general orders in that work: for in an Hony-dew Bees neither rob one another, nor fight, nor ſwarm, nor kill their Drones, nor watch, nor do any other work but fetch in hony, and lay it up haſtily in the Hive to be preſently gone again for more, and not ſo much as ſtaying to ſtop up their Cells where they put their hony, until afterwards: and thus it is only at ſuch a time, and ſo long as the Hony-dews are falling; and until the Sun by ſhining hot dryeth it from off the leaf of the Oak-tree, and other places whence they take it.

Bees never ſwarm but by the order and conſent of the King; and when they ſwarm, it is in obedience to him, as Mr. *Butler* alſo teſtifies, *page* 3. of his Feminine Monarchy, ſpeaking of their Ruler as a Queen, in theſe words; *If by her voice, ſhe bid them go, they ſwarm.*

The Cauſes of Swarms are different; the Reaſon of the ſecond Swarms are not the ſame with thoſe of the firſt Swarms, as I ſhall ſhew in this Chapter; for the Bees lack not room when the ſecond Swarms go forth. The reaſons of the firſt Swarms are the ſame with theirs who plant themſelves in any new-found place, and ſettle there, without intention of removing thence again to their old habitations. The chiefeſt Cauſe is lack of room, the other are but the circumſtances as the conſent and order of the King; good weather, a proſpect of plenty to come, and fitneſs: which fitneſs is when the Hive is quite filled with Bees, and they have ſtore of riches, and a King-Bee ready: without all theſe circumſtances, Bees ſeldom ſwarm though they do want room: but all theſe circumſtances conjoyning with lack of room, is the certain cauſe of firſt Swarms; but where they have room, as in Colonies duly raiſed, the Bees never ſwarm, but in caſe of diſtaſte, by accident, diſturbance, or miſmanagement, which is very rare.

The Cauſes why Bees ſwarm not when fitted, and wanting room, as in ſome ſtrong Stocks, is, becauſe being full and rich, the King will neither leave his Kingdom, nor part with his People, leſt he ſhould be thereby impoveriſht; and then the Bees make Combs where they lye out. And Colonies, although ſtrong, rich, and full, yet having room added to them, the Bees continue

their working without idleneſs or intermiſſion as long as Hony-gathering laſts.

Although many times two or three Kings go out in a ſecond Swarm for the reaſon before mentioned in the laſt Chapter; yet I never knew but one to go forth with the firſt Swarm, and then the old King generally goes forth himſelf with them, becauſe having a proſpect of a more rich, pleaſant, and flouriſhing Kingdom, he leaves his decaying and unpleaſant Kingdom (by reaſon of the ſtoping and noiſomneſs in the old Combs) to his Succeſſors: and with him the greater number of the Bees will go, and that is the cauſe that Bees ſo often overſwarm themſelves, and leave the old Stock thereby ſo lean, that ſometimes they die for want of numbers to keep them warm in Winter, or elſe for want of food in the Spring, or at beſt are two Summers after before they recover themſelves to be in good caſe again.

Mr. *Butler* (the moſt judicious Writer of Bees in his time) *page* 70. and 75. of his Book, ſuppoſeth that the firſt Swarm went forth at the will of the Commons, becauſe he very rarely heard thoſe muſical notes of the King-Bees anſwering one another (which are well known to be the certain ſigns of a ſecond Swarm to come forth; for the young Prince is expelled, if the King gives not his conſent by anſwering his petition in three or four dayes) till after the firſt Swarm was gone forth: and when the firſt Swarm returned home again, he could as ſeldom hear thoſe muſical

muſical notes in order to their ſecond going forth, though he could conſtantly hear them before the ſecond Swarm did come forth: which ſuppoſition of his appears to be againſt later experience. For the King orders at once what the Bees readily execute in obedience thereunto, and ſo he hath no need to give his conſent or orders for another King to go forth when he intends to go himſelf.

And if the King-Bee which firſt goes forth, through Age, and want of flying well, or the like, happens to miſcarry, and with his Attendants periſhes for want of coming to the place where the Swarm is ſettled, then the Swarm finding themſelves without a King, return home again to their relinquiſht Prince, as ſometimes it happens, *viz.* as often as Bees return home again after they are ſwarmed and ſetled (for ſometimes the Bees miſs their King before they ſettle, and then they return home again without ſettling at all) but when it happens thus, then that Prince who is King by the loſs or death of his Sire, taketh his own choice, whether he will go himſelf, or ſend his younger Brother, and when he will not go himſelf, whether the Bees ſhall ſwarm again or not: ſo that it appeareth by this, that Bees ſwarm not their firſt Swarm, but according to the orders of their King as well as their ſecond Swarm, which all experienced Bee-Maſters know is not without his conſent and orders.

The reaſon why firſt Swarms will not go forth

forth but in very good weather, is becauſe the King goeth when he pleaſes: and ſecond Swarms go forth at the time appointed in any indifferent weather, becauſe their King goeth forth at the will of his King or Sire; who oft grants leave, being propitious to the Royal Lineage; which indulgence of the King to the Royal Lineage, is the only cauſe why Bees ſwarm when they have room enough, as in ſecond Swarms (except only the caſes of diſturbance and diſtaſte) of which indulgence there is little occaſion of uſe in firſt Swarms.

Bees often provide themſelves of an habitation before they ſwarm, *viz.* as oft as they fly quite away from their owners without ſetling, for they have not reaſon to know that their owners will give them an houſe, and ſo ſettle to be put thereinto: but when they are not before provided, it is becauſe the quick and often flights of young (eſpecially in wet weather) ſuddenly fill the Hive, whereby they lack room, and then they are as ſuddenly forced out by the preſent orders of the King, and ſo they ſettle to take time to look out for a place, in which juncture of time comes the owner and furniſhes them, before their Scouts return: and if the King be with them, and the Hive dreſt, they will ſtay in the Hive given them; otherwiſe they are diſcontented, and will not ſtay therein.

Sometimes alſo they ſettle in order to fly all away at once, being before provided of

an

an houſe, and then they will not eaſily ſtay in the Hive given them, unleſs it be very well dreſt.

CHAP. V.

Of the Bees Loyalty to their King.

THat Bees naturally abhor Rebellion and Treaſon, I doubt not, becauſe I never knew, or heard of any diſturbance in an Hive of Bees within themſelves, and when other Bees come within the Hive, their fighting with them ſhew their Loyalty to their own King, becauſe none of the Bees will take part with the Invaders; but all fight to the laſt againſt them to preſerve their own Soveraign in ſafety.

The Bees Loyalty to their Soveraign wonderfully appears by their exceſſive love to, and induſtrious care of his perſon: for without him they value not their own lives, as you may obſerve by a Swarm though ſettled and hived, yet if without their King, how diſcontented the Bees will be, and will not ſtay in the Hive by any means that can be uſed, but return home again, whilſt others of them that attend him, though but an handful ſome diſtance from the Swarm (perhaps) fallen on the ground, where they encompaſs him about, yet there, that handful will live and die with him, rather than forſake him;

if

if he cannot reach the Swarm, which happens as oft as the Swarm cannot find him to come to him; for, it is for want of him they do return home again after they are ſettled or hived.

And you may obſerve by a Stock or Colony when by any Accident or Miſmanagement the King happens to be loſt, they preſently miſs him, and then many of them fly abroad in ſearch after him whilſt the reſt languiſh at home; and if the others return not in a while, many of them alſo go out in ſearch after him, and thus they give not over ſearching for him, till either they find him or loſe themſelves dying in their ſearch. Of which I ſhall here relate one example for the ſatisfaction of all Perſons who read this, which example is thus: About the end of *Auguſt*, 1678. within one week before his Majeſty went to *Windſor*, at his Majeſties own Bee-houſe in the Royal Garden in St. *James's* Park: Which Houſe I had erected the Spring before. The Kings Majeſty and ſome Perſons of Honour being then preſent, I took the uppermoſt Hive off of a Colony, and having taken the Bees out of the Hive from the Hony and Combs, I took alſo the King-Bee which was in the uppermoſt Hive at that time, being late in the year, I kept him ſome time, and put all the Common Bees to their fellowes that were at home in the lower parts of the Colony (with their ſtore of Hony which is left for their Winter-ſtore) the Bees preſently went home crouding

crouding one another, as Sheep into a fold without taking wing, and when they were all within, the firſt work they did (as is their cuſtom) was upon this diſturbance to ſee if their King were ſafe, and among them; (whom I ſtill kept from them) and miſſing their King, preſently ſome fly abroad to ſeek him, ſome crept, and others ran up and down, as men in a tumult, or like unto perſons diſtracted: then I put their King into the Colony to them, and in the ſpace of two minutes, which was as ſoon as poſſibly they could know throughout the Colony that their King was come home, the Bees did preſently by their actions and voices proclaim it at the door, upon which, all thoſe that were abroad, and flying about in ſearch after their King (which were almoſt half the numbers of a ſecond Swarm) immediately returned home, where they all together ſeemed to make a cheerful noiſe among them, to the admiration of all that were preſent.

I have alſo done the like, and had the ſame effect with ſeveral Colonies, where I have come too late in the year; but although I can do it my ſelf at any time of the year with ſafety to the King Bee and Colony, yet my adviſe to young Practitioners in this Art is to do it whilſt the Drones are in the Hive, and the King-Bee in the middle Box, as I ſhall further ſhew in its proper place in taking off the uppermoſt Box.

CHAP.

CHAP. VI.

Of the Bees *Valour, Juſtice, Manner of Fight, and Places.*

THeir Valour exceeds all creatures, fearing no enemy, how great ſoever though never ſo terrible, eſpecially near their Hive, and in defence of their King, for nothing but death can quell them, becauſe they will never yield.

The Bees are very juſt to one another, and not the leaſt injury is offered among them, within their own Kingdom; but the Bees of ſeveral Stocks and Colonies are not ſo, for being ſo many particular Kingdoms, each of them are concerned only for their own Kingdoms welfare; which together with their jealouſie of being robbed, is the only cauſe why they kill any ſtrange Bees that through miſtakes come into their neighbours Kingdom, but ſometimes they will not kill one that comes ſo when he is alone, and well laden, but ſuffer him to go out again, becauſe they know that ſuch come not with intention to rob and ſteal.

When Bees fight with Bees the King orders the battel (except in ſmall skirmiſhes when thoſe only fight which are appointed to watch) and walks up and down animating them with his voyce, and like a General rallying

lying his ſcattered troops, and when he leads them on, they are ſo ſenſible of his worth that they unanimouſly expoſe themſelves to death it ſelf to ſave him harmleſs, and in their fighting they bite one another with their fangs, ſomtimes by their wings, ſomtimes under their wings, & ſomtimes by their legs, for they ſeldom uſe their ſtings one againſt another in their fighting, never unleſs much provoked, and not able otherwiſe to right themſelves; as when they oppoſe men, cattel, or fowls, becauſe they know that it is death to themſelves, as *Virgil* mentions, *Georg. lib.* 4.

----animamque in vulnere ponit.

The Common Bees in their fighting with one another, neither give nor take quarter, neither is there any ceſſation of hoſtility among them, until one ſide or the other be Victor by the total deſtruction of the weaker party, unleſs when two Swarms come, or are put together before they are ſetled in their new habitation, then ſometimes they proclaim a general ſilence; and then if one of their Kings hath his reſidence in the place of his Throne, the other is expelled or ſlain; but when both the Kings are alike in their places of command, then the Bees fight it out.

Another occaſion of their ceſſation of hoſtility, is when they are diſturbed by Art, which is by ſpurting with the mouth ſo much ſtrong Hony-liquor, or Ale among them, that they may ſmell all alike; the reaſon of which is, becauſe

becauſe they diſtinguiſh one another by the ſenſe of ſmelling, and by diſturbing them thus artificially you may put any Bees together at any time, and prevent their fighting.

The King-Bee's Throne is in the top of the Hive, to which he alwaies haſtens when any diſturbance happens, and thither to him repair the Hony-Bees (as may be ſuppoſed) for orders and directions, eſpecially in caſe of a fight.

The Bees in the Hive lodge not in the cells of the Combs, they ſerving only to breed in, and to lay up their ſtores of Hony, only the Pavillions in which their Kings are bred they never put any Hony into, the Bees (unleſs in Summer when they fill their Hive) creep all together cloſe between the Combs where they make one entire globulous body neer the upper parts of the Hive. The common reſidence of the King-bee is in the center or middle of this globulous body, except, in caſe of diſturbance, and then he haſtens to his Throne.

To conclude this Section you ſee that Bees (creatures without reaſon) have not only prudence and foreſight, joyned with art and induſtry, perfect order and diſcipline in their government, being naturally loyal, valiant, and magnanimous, and abhorring as well rebellion and treaſon, as cowardiſe and ſloth, all which plainly ſhew that nature in Bees laying down ſuch a pattern ſhould not only be imitated, but ſurpaſſed by men, leſt

they ſhould be reproved by theſe unreaſonable creatures, as too many are, who have not only reaſon, but the light of the Scriptures to guide them in the exerciſe of thoſe vertues ſo plainly ſeen in the Bees.

Secton

Section 3.

Of the Generation of Bees.

CHAP. I.

Of their Breeding in general.

THE Bees begin their breeding of young ſooner or later, according to their ſtrength and numbers, for the greater their numbers are, the greater is their heat, and by how much their heat is greater, by ſo much the ſooner do they expedite their young brood to fly; but all Bees begin to breed as ſoon as they are able to fly abroad, and the Trees and Flowers begin to bud, which is commonly about the beginning of *March*: they breed all the Summer time, and leave off breeding as ſoon as the time of Hony gathering is fully paſt, which is commonly in *Auguſt*; and then they hatch up only what young are in the Cells: the reaſon of their breeding thus conſtantly, is for propagation and continuance of their kind, and that they may have the greater numbers when Hony-dews fall: for we ſee thoſe Stocks or Colonyes which have the greateſt numbers of Bees are alwaies the richeſt.

Concerning the manner of the generation of

Bees, ſeveral Authors have written variouſly of them as followeth.

Ariſtotle, *Pliny* and *Virgil* call the Ruler of the Bees by no other name than Βασιλευς, and *Rex*, *i. e.* King.

Ariſtot. de hiſtor. anim. l. 5. c. 2. *Ariſtotle* concludes; *coeunt ea in quibus mas & femina eſt*, Thoſe creatures conceive by copulation, where there be males and females.

Idem de hiſtor. anim. l. 5. c. 1. And again; they that are bred of the ſame ſort, or kind, if there be among them male and female, *e coitu generantur*, they are bred by copulation.

Candan de ſubtil. l. 11. *Cardanus* denies that the Bees lay Eggs.

Ariſtot. de generat. l. 3. c. 10. *Ariſtotle* argues, that Bees engender not together, becauſe there be but few young in their Cells, and they not quickly hatched; but other Inſects that are procreated by copulation engender long and hatch quickly: And where *Ariſtotle* relates it as an Opinion of others that Bees breed by copulation, and that the Drones are males, and the Honey-Bee female; this, ſaith *Scaliger*, is falſe, for the Bees indeed are females, but the Kings are the males.

Scalig. comment. in Ariſt. de anim. l. 5. c. 19.

Muffet in Theat. Inſect, l. 1. c. 3. Mr. *Muffet* alſo acknowledgeth no males among the Bees but the Kings.

Mr. *Remnant* in his Hiſtory of Bees ſaith, that the matter in which they blow or breed, is ſomething that they gather off the Flowers or Plants, and bring home, and put into the holes or cells of the Combs, which they mix finely with a little water, and then blow in it a little thing as big as a Fly-blote.

I conceive the matter he means is that organizable matter I ſpake of page 6. and by the little thing I conceive he means the ſperme which the King-Bee injects into each matrix to that matter.

Mr. *Butler* in his feminine Monarchy concludes that the Drones are males, and that the Ruler, and the Honey-Bees are all females, withal page 54. aſſerting that the Bees uſe not copulation; but conceive in a ſecret unknown way by the Drones.

Mr. *Purchas* alſo in his Theatre of inſects aſſerts the Drones to be males, and the Honey-Bees females; but how the Honey-Bees receive a prolifick vertue from the Drones he diſcuſſes, denying that they uſe copulation and citing *Albertus magnus libr.* 26. as ſaying that Bees uſe not copulation, yet granting the Drones to be males, and the Honey-Bees females. Then he further ſaies that the Honey-Bees may have a maſculine vertue from the Drones otherwiſe than by copulation; inſtancing in the Eele and other Fiſhes that produce their young without copulation; but I think he was beſides the mark in his inſtance, becauſe thoſe creatures produced in the watry region cannot be examples of thoſe produced in the

airy

airy region, beſides the Fiſhes ſpawne receives prolifick vertue from the males.

Some others grant the King-Bee to be the parent of all the Bees, but yet ſuppoſe him to be a female, and that the ſperme which he ejects are Eggs, and that that part of his body whence he doth eject it, is her matrix.

Having thus layd down the opinions of ſeveral Authors, and finding by my experience that there have been divers miſtakes by ſeveral concerning the ſexes of the Bees, and their manner of breeding, (divers of them in their writing alſo concluding, *non tamen ſatis adhuc explorata quæ eveniant habemus*, that is, we have not as yet ſufficient experience what may happen) I ſhall therefore conclude their miſtakes under three heads, *viz.*

Firſt; that the Drones are males, and the only males among Bees.

Secondly; that the Honey-Bees as females (though without copulation, yet) do conceive by the Drones.

Thirdly; that the Ruler of the Bees is a female.

I ſhall therefore here lay down the reaſons why I differ from their notions, and in the next Chapter lay down my aſſertions, and endeavour to prove them.

Firſt; Its not probable that the Drones ſhould be males becauſe there are none eight whole months together, ſo that of neceſſity the Honey-Bees muſt be pregnant above eight months together, when we ſee the Bees finiſh each ſeveral Brood in leſs than thirty daies

daies time in the Spring, and ſooner in the ſummer time, for in all the cold winter ſeaſon all men (that keep Bees) know that there are none young in the Cells.

Secondly; If the Honey-Bees as females did conceive by the Drones, they then muſt of neceſſity conceive for three or four births before hand; for we ſee that the Bees breed no Drones until the ſecond brood is fled, and commonly not until the third Brood is fled. So that I conclude, that it is no more probable that Bees ſhould go eight or nine months pregnant with a treble conception (of which alſo they muſt be delivered before the Drones have any being) than for a Mare to conceive three Colts at once and be delivered of each Colt three Months time one after the other.

Thirdly, If the Ruler of the Bees were a Female, ſhe could not breed any Young without influence from the Drone, any more than the other Bees could; nor lay prolifick Eggs, but by influence from ſome Male, and none could ever yet aſſign any Mate for him.

Fourthly, Were the King-Bee a Female, this abſurdity would follow, *viz.* that ſhe muſt conceive without a Male, and have of her ſelf *ab initio*, Eggs of an active quality and power for production of young Bees, which experience tells is not poſſible, for his ſperm (though at firſt ejection thereof it hath ſome form, as alſo hath a drop of liquor falling down, yet it) diſſolveth with the heat of ones hand, which no Egg of any Inſect doth; for though the

Eggs of Inſects have not a perfect ſhell, yet have they a certain skin incloſing every diſtinct Egg, not eaſily frangible by a gentle touch, but this Sperme of its ſelf diſſolveth, whereby it is mixed with the animable matter to which the King-Bee injects it, into each matrix: in which matrix, the Egg is formed for the production of each Bee.

Fifthly; I differ from their notions of them, becauſe this Sperme is generated naturally in the body of the King-Bee, as is the Sperme in a Cock, or in the male Silk-worm.

But Sixthly and Laſtly; I differ from their opinions becauſe the Bees do never copulate, and therefore there is no need of the Drones for that purpoſe; for the Bees do breed their young without copulation according as *Virgil* in his Georgicks *libr.* 4. writ of them as followeth.

Illum adeo placuiſſe apibus mirabere morem,
Quod nec concubitu indulgent, nec corpora ſegnes
In venerem ſolvunt; aut fœtus nixibus edunt:
Verum ipſæ foliis natos, et ſuavibus herbis
Ore legunt: ipſæ regem parvoſque Quirites
Sufficiunt, aulaſque et cerea regna refigunt.

Which I have thus tranſlated.

It is a wonder worth our obſervation
That Bees breed young, not uſing copulation,
Nor ſpend themſelves in Ven'ry: but without uſe
Of birth: from Herbs and Leaves their young produce

For; with their fangs, their progeny they take
And Princes too, with Courts and Kingdoms make.

And if the Bees do breed without copulation (as almoſt all writers do agree becauſe it was never yet ſeen by any man) then I ſee no ground to believe there can be any conception, and without conception I think there can be no parturition or bringing forth either of young, or Eggs that be prolifick, and in the body of the common Honey-Bee I could never yet find any thing like Eggs or Sperme, nor any other as ever I read or heard of. But for any Female to conceive without copulation, it can be no otherwiſe but by the wind, as *Æſops Babylonian* Mares (in the Fable) conceived by the Horſes that were in *Ægypt* the ſame time. Or as a pair of Breeches lying upon a Bed got the maid with child.

CHAP.

CHAP. II.

Of the Generation of Bees in particular.

THE aſſertions which I lay down concerning the manner of the generation of Bees are three.

Firſt; That the King-Bee is a Male, and the only Male in every Colony and Hive of Bees.

Secondly; That the common Honey-Bees are the Females, but not by vertue of any copulation or conception, but becauſe they ſupply the place and Office of the Female.

Thirdly; That the Drones are neither Males nor Females, but ſervants under the Honey-Bees, produced by nature to ſupply the abſence of the honey-Bees for a time.

To prove theſe three aſſertions, I ſhall lay down three reaſons and then proceed to ſhew my experiences concerning the breeding of Bees.

The firſt reaſon is, becauſe it is the property of the Male, and of the Male alone, to eject Sperme; And the King-Bee only hath Sperme, and doth eject it; and therefore, he, and only he, is the Male among the Bees.

The ſecond reaſon is, becauſe it is the property of the Female to prepare the matrix, and to adminiſter augmentation to the Sperme

ſo

ſo as to bring forth, or hatch up; and becauſe the Honey-Bees prepare the matrixes by building the Combs, and adminiſter augmentation to the Sperme, by gathering of animable matter, and by puting it into the matrix, ſo as to hatch up the young Brood by lying cloſe about it, and keeping it in a conſtant heat: therefore they (though not by copulation nor conception, yet) are the Females.

The third reaſon is, becauſe as nature never produceth any creature in its whole kind without parts and inſtruments to perform the end for which it was produced, ſo likewiſe nature produceth no creature in its whole kind with ſuch parts for which no end is by nature deſigned, and conſequently the Drone being produced without parts or inſtruments for the production of Bees either as male or female, therefore he is properly neither male nor female but a redundancy of nature.

But more fully to prove my aſſertions, I ſhall enlarge upon each of my reaſons in ſhewing my experiences, and afterwards anſwer ſomes queſtions.

As for my firſt Reaſon, that the King-Bee hath Sperm, and doth eject it, any man by diſſection in Summer-time or Autumn, may find that he hath Sperm in his Body; and whereas no Bee-maſter can averr, that ever he ſaw any other Bee eject Sperm, yet I do affirm, and can bring teſtimony, that the King-Bee doth eject Sperm in this manner, *viz.* juſt at that part of his body, where he is only

yet

yet the full length of a common hony-Bee, he opens his body, and bending his tayle (wherein his ſting is) ejects one ſeed at a time, which ſeed is white, and as ſmall as a white thred, and ſomewhat bigger at each end than in the middle, and not half a quarter of an inch in length; when he hath ejected one ſeed, he ſhuts his body again by reverting his taile and ſting into their uſual form again, by which reverſe action his part where he openeth his body is ſhut cloſe again with a joynt (in like manner as do the joynts in the tail of a Lobſter) whereby he retains and ejects his ſperm at his pleaſure. This will further appear by this example following, being matter of fact. In *Auguſt* laſt, in my own garden in the *Bowling-Ally* in *Weſtminſter*, I took the King-Bee out of an Hive, and there was preſent with me Doctor *Hobart* a Phyſician, and ſeveral others: This King-Bee I kept in my hand about half a quarter of an hour, and then looking on him, we all plainly ſaw where, and in what manner he did open and ſhut his body, ejecting his ſeeds one by one; as above-ſaid. The Doctor and my ſelf, and the reſt who were preſent, did perfectly ſee and know, that that which this King-Bee did eject, was ſperm by its colour and ſubſtance, becauſe after a ſmall ſpace of time it diſſolved from its form by the heat of my hand, and that it was not his excrement; for excrement is thin and yellow, and evacuated at another place ſome diſtance from whence this was ejected, *viz.* juſt under his ſting; and that it was not Eggs, but ſperm, becauſe it had

had no skin to keep it in the form it was ejected in, as we ſee the Egg hath within the ſhell, as alſo hath the nit of a fly-blow, and a Silk-worms Egg. Upon ſight of this the Doctor preſently affirmed, that if there were but one ſuch Bee in the Hive, he muſt of neceſſity be the Sire of all the reſt: The King-Bee when he did eject this ſperm, walked, and every ſtep he took he ſtood ſtill, opened his body, ejected one ſeed and ſhut his body again, then took another ſtep, ſtood ſtill again, opened his body, ejected one ſeed, and ſhut his body again, and thus he did ſix times ejecting ſix ſeeds preſently one after another, as he walked on my hand, every ſtep he took being the length of the diſtance of a Bees Cell; ſo that each ſeed, as they lay on my hand in length, did ſcarcely touch one another, thereby anſwering the diſtances of the ſeveral Cells in the Comb. Then I kept him about half an hour longer, and he did the ſame again, opening and ſhutting his body in the like manner, walking on my hand, until he had ejected about twelve times, and yet to our obſervation as vigorous and ſtrong as at the firſt; after which I put him into his Hive again.

Now as no female can produce young, without influence from the male, ſo an whole Hive of Bees, with many Drones among them cannot breed any young if there be not a King-Bee with them; becauſe when they have no King-Bee, they have no male among them; which I have often ſeen, and helped them with a King-Bee from another

poor

poor ſtock, with whom they have done very well, which otherwiſe muſt have periſhed in a ſhort time, for want of poſterity, becauſe they could not propagate their kind for want of a male: But, for further ſatisfaction, that Bees breed not (becauſe they cannot breed young without a King-Bee, I ſhall here relate the following example which ſeveral Gentlemen, who were eye witneſſes of the ſame, will teſtify.

A Gentleman who now lives in *Weſtminſter* to whom with ſome others I gave a viſit about the latter end of the Summer in 167[illegible] and walking into his Garden, I looked on his Bees, and perceived the languiſhing condition of one of his Colonies by the not working of the Bees; and I told the Gentleman, that the Colony, through ſome miſmanagement, or accident was deprived of his King-Bee, the conſequence of which would be, that they would pine away, and die, or yield to the robbers, for they could not have a ſupply of young Bees by breeding, although they had Drones among them, becauſe their King-Bee, the only male, was wanting; then to ſatisfy him that they did not breed, I turned up the Colony, and ſhewed him their breeding places, where we all ſaw that all the Combs were dry and empty, except above where their hony was; ſome of which I did break to let them ſee that it was Honey, and not young Bees in thoſe Cells ſtopped up, for there was not one Grub in all the Cells: then, to ſatisfy them further I ſhewed them the inſide of another

nother Colony, which had his King-Bee, and there they ſaw ſtore of Grubs in the Combs in the breeding place. I then told the Gentleman, I could yet ſave this Colony, by putting to them another King-Bee, which I did thus:

He aſſigned me a Straw Hive, out of which I took moſt of the Combs with moſt of the Bees, and in the crown or top of the Hive, I took the King-Bee, and produced him to their view, after which I immediately carryed him to the Colony, and about a ſcore of Bees with him, and put them together into the mouth of the Colony, whereupon a greater company of Bees from the Colony fell upon them, and in a minute killed all the company of Bees, except the King-Bee: and although the Gentlemen thought he could not have eſcaped death in the croud, yet they ſaw clearly that when the Colony-Bees came to him, they Sopt, and as ſoon as all the reſt were killed, and carried away, they came to him with all imaginable reſpect, and conducted him up into the Colony, which we through the glaſſes ſaw, and there owned him for their King; the ſucceſs of which was that immediately they fell to their labor and breeding, and bringing home of generative matter, which before they did not, inſomuch that they ſoon had a Brood of young in their Combs. Upon which the Gentleman perceiving that I was ſo exact in finding out the King-Bee, deſired me to bring him another King-Bee out of ſome Hive out of the Country, which I did, & upon the 28th. of *Aug.* 1677. preſented him to the King's Majeſty with about

about a ſcore in His company for diſtinction, among which His Majeſty immediately diſcern'd him, wonderfully different from the other Bees, according to the deſcription of Bee-Maſters.

Alſo, though an whole Hive of Bees cannot breed without a King-Bee, yet I have good reaſon to believe that it is more than probable that one King-Bee alone (if he could outlive a winter) might breed Bees without the help of the common Bees ; and I am the more confirmed in this opinion, becauſe we ſee the likeſt inſect the male-waſp, that he makes his own Comb in his neſt, and breeds all his young alone, lying in the midſt of ſix or ſeven Cells, without the help of the common Waſps, until ſome are hatched, and then the Waſps breed faſter, by having more heat among them; the male Waſp breeding thus alone, is the cauſe why we ſee ſo few of them abroad until the Summer be almoſt ended ; for the common ſort of Waſps do all dye every Winter, but the male-waſps fly away and are not killed, as are the male-Bees, becauſe they fly away, and ſo are not in a capacity of undermining that government which of it ſelf muſt be ſhortly extinct, nature its ſelf ſo wiſely ordering the deſtruction of thoſe vermine: for every male thus flying away, lives in ſome obſcure place (being of a ſtronger conſtitution than Bees are) untill the next ſpring, and then every one that lives ſo long, makes a ſeveral neſt where he can find a place. The King-Bee hath no need thus to breed alone, and take ſuch pains to gather generative matter

matter out of vegetables for the production of Bees, becauſe he hath a multitude of Subjects, that do it at his command; and it is evident, that the great numbers and heat of the Bees much helps them to breed ſo faſt in the Spring, that they have ſuch multitudes before the Honey-Dews come; for we ſee in very poor ſtocks, and caſts ſomtimes but an handfull of Bees in all left, and yet they live and breed (having their King with them) but ſo ſlowly and ſo few for want of heat, that though they eſcape the robbers, yet cannot recover themſelves to gather enough whilſt Summer laſteth, to keep them in the Winter following.

As for my ſecond reaſon, that the Hony-Bees are not females by copulation or conception, but by ſupplying the place and office of the female.

Beſides, what is aboveſaid concerning the ſimilitude of the male-Waſp ſupplying himſelf in the feminine office, I thus make it appear: if they did copulate with the King-Bee (which is the only male) then of neceſſity they muſt (as other Inſects do,) receive his ſperm into their bodies, and ſo conſequently lay prolifick Eggs (as the Silk-worm doth) into their ſeveral Cells: which they do not, as I could ever yet find or hear of any that ever did; therefore I conclude that it is not ſo.

But further, that place which receives Sperm, and retains it in order to propagation, is a matrix: and the ſeveral matrixes whereinto the King-Bee injects his ſperm, none can deny but that they are all prepared and built by the

Hony-Bees which are theſe:

Each of thoſe particular oblong pavillions at the Edges of the combs is a matrix for the production of the Royal Race of each King-Bee becauſe it receives and retains his ſperm to that end: and each Cell in every ordinary Combe is a matrix to receive and retain his ſperm for the production of each common Hony-Bee; and each Cell in the Drone-Comb (which Cells are larger and deeper than the Hony Bees Cells are) is a matrix to receive and retain his ſeed for the production of each Drone Bee.

Now, that which adminiſters augmentation to ſperm, ſo as to hatch up, or bring forth, may eaſily be ſuppoſed to be in the female; or that it is her part and office to do it. The *materia formabilis*, or corporaell part of the young Bee, is, that generative matter ſo plentifully brought in by the Hony-Bees on their thighs, and by them put into the Cells into which the ſperm of the King-Bee is injected, and they ſupply the place and office of the female further by duly commixing the forementioned generative matter with the ſperm, according to the ſeveral ſorts of Bees to be generated, whether a King-Bee, a common Hony-Bee or a Drone-Bee, which being duly mixed in the Cell, and covered, reſembles an Egg in the effect, though not altogether in the form, the ſperm of the King-Bee and the generative matter collected by the Hony-Bees being therein united in order to production, by their conſtant heat adminiſtred to it, each Bee is produced.

As

As for my third reaſon, that the Drone hath neither parts nor inſtruments for generation either as male or female. As male, I never yet could find any ſperm in a Drone by deſection, as I have found in a King-Bee; and whereas ſome ſuppoſe the Drone to have teſticles becauſe he hath an obtuſe tayl; it is not ſo; for that part of him which they ſuppoſe to be teſticles, is only the fleſhy membranous ſubſtance of his obtuſe form and tayl; but ſeeing Bees never uſe copulation, I know no reaſon why they ſhould ſuppoſe that nature produced teſticles in the Drone for no uſe; for males they cannot be, becauſe the Bees cannot breed when they have Drones among them, if the King-Bee is wanting. As female, the Drone never works, becauſe he hath no fangs, and ſo is uncapable of doing the part of a female; for the Hony-Bees do moſt of their works for breeding with their fangs, for with them they gather nutritious or augmentative matter fit for generation of *fœtus*: and with them likewiſe, they commix the aforeſaid matter in the matrix of the Cell, with thoſe active principles contained in the ſperm of the King-Bee.

Thus their fangs are their inſtruments with which they in a great meaſure ſupply the part and office of the female; the Drone therefore cannot be a female, becauſe as all men may plainly ſee he hath no fangs wherewith to work; but the moſt certain reaſon why the Drone is neither male nor female, is becauſe two or three, and ſometimes, four generations

of Bees are bred in many ſtocks before any Drones appear to be among them, which were impoſſible if the Drones were males or females.

Moreover, I have known ſeveral ſtocks of Bees to have bred and increaſed until Midſummer, without having any Drones among them.

Alſo the uſe and nature of the Drone ſhew that he is not neceſſary either as male, or female being produced by nature only for an help in a time of neceſſity; as I ſhall now ſhew,

The Drones when come to maturity, ſerve for no purpoſe but to lye at home cloſe to the combs where the young brood is (their form being by nature produced ſuch, for the ſame end) to help to hatch up the young brood as a Capon hatcheth the Eggs of an Hen by ſitting on them; for what the Country woman doth by art (in pulling off the feathers from the Capons breaſt) to make him ſit on the Eggs; the ſame is done by nature among the Bees in producing the Drones in ſuch a form, and at ſuch a time, as they have moſt need of them to ſit cloſe and help to hatch the young ones, which the Hony Bees need them not for, but can do it themſelves untill the time that Hony gathering comes; and therefore the Bees breed not their Drones ſo early in the ſpring, but as neer as they can, juſt before Hony-Dews fall; becauſe they would have the uſe of them at as little charge of feeding them as they can, which uſe of them is, whileſt the Hony Bees are at their labours abroad in gathering Hony; for, as the Bees by

by inſtinct foreſee a ſucceding winter, and provide for it; ſo do they foreſee the evil conſequence that would attend their exceſſive induſtry under the temptation of Hony-Dews, which would certainly draw them out to ſuch a degree as their young brood might periſh at home for want of a ſuitable heat, were it not that nature had provided ſuch a ſort of Bees as are lazy, and ſhaped fit to lye at home, and in the others abſence to hatch their young ones, and when they had ſerved that turne, then to dye.

For, their natures are ſuch, that they cannot endure the coldneſs of the ſeaſon in *September*, but dye then of themſelves, if ſpared ſo long by the Hony-Bees, but they are generally killed in *July*, and *Auguſt*, *viz.* a little before their own time of dying (becauſe Hony-gathering being paſt, the Bees have no more need of them) to ſave that ſtored proviſion which thoſe uſeleſs eaters would conſume in that ſhort time.

Alſo the Bees will not only be without Drones as long as they can; but when Hony-gathering comes late (to ſave their ſtore) they pull them out of the Cells before they are ripe, whilſt they are white; this they do whilſt ſome are among them, leſt they ſhould ſuddenly want them: ſometimes alſo they pull them out in like manner whilſt Hony gathering laſts, to fill thoſe Cells wherein they were with Hony: the reaſon of all is, becauſe the Bees are thrifty, and know that they have them as vaſſals to ſerve their preſent need of them; an

example, of which you may eaſily try, by killing a Drone in cruſhing him at the mouth of any Hive, and the Hony-Bees will not be angry; but kill an Hony-Bee in the like manner and place, then preſently the other Bees ſcenting it, will ſhew their anger by ſeeking revenge on you.

CHAP. III.

The Manner of the Generation of the King-Bee.

THoſe oblong pavillions, beforementioned on the edges of the Combs, are each matrix; and the common Hony-Bees extract from ſome particular Vegetables a peculiar and ſelect animable matter, which they put into thoſe matrixes, to which the King Bee injects his ſperm, and as ſoon as that is done, the cavity is filled up with more of the ſame matter, and duly mixed by the common Bees, who cover it over with wax. That ſelect matter which fills up the vacuity of the matrix, being both nouriſhment and augmentation to the ſperm of the King-Bee, as the meat in an Egg is to the Cocks tread, which produceth a Chick with the warmth of the Hens ſitting; ſo in like manner this being kept in a conſtant heat by the warmth of the Bees lying cloſe about it, in proceſs of time produceth a King-Bee, with his form and

and lineaments, which as ſoon as it comes to its vigour and perfection, opens his own way out.

CHAP. IV.

The Manner of the Generation of the Honey-Bees.

THE common Honey-Bees are thus produced: The matrixes are each particular Cell in the common Hony-Comb, among which the King-Bee walketh from one Cell to another, and as he walketh, he injecteth one ſeed into each Cell, in the manner as I have before deſcribed; begining cloſe under the Hony which is towards the upper parts of the Hive,& ſo going on downwards in rows as low as the globulous body of the Bees doth reach, and from ſide to ſide in the ſame largneſs of circumference as the globulous body of the Bees doth reach, and the King-Bees ſperm being thus injected into each Cell after the Hony Bees have firſt put in ſome generative matter, by degrees as he injects his ſeed one by one ſo by degrees the Hony-Bees fill up thoſe Cells one after another; and when the matrix or Cell is thus filled up with this generative matter, the Hony-Bees (by inſtinct) mix the aforeſaid matter with his ſperm, alſo uſing water withall for the more convenient

moiſture and due mixture of it; then this being finiſhed, they cover over each Cell with wax: the generative matter collected & lodged in the Cells by the Hony-Bees being deſigned by nature for nutrition to, and augmentation of, the ſperm of the King-Bee, as is recited by the Egg; and thoſe matrixes being kept in a conſtant heat by the Bees, in proceſs of time converts that ſperm and matter ſo mixed, firſt into a maggot, with its full magnitude, which ſoon converts into an Hony-Bee, which opens its own way out; for the matrix being ſtopped cloſe up, and covered with wax at the firſt mixture of the ſperm, and the aforeſaid generative matter, that waxen cover is not opened untill the Bee it ſelf opens its own way out.

CHAP. V.

The Manner of the Generation of the Drone-Bees.

ONE vulgar Error concerning the Generation of the Drone-Bee is, that a common Hony-Bee when he loſeth his ſting, then degenerates into a Drone: which if ſo, would be a contradiction in nature; becauſe it is not poſſible for any creature by the loſs of its entrails to grow bigger, but dye; for with his ſting an Hony-Bee loſeth his entrails alſo.

alſo. And, experience plainly ſhews, that the Drones are bred in their Hive, and in their full magnitude; Thus,

The Drones are generated with the ſperm of the King-Bee, and the forementioned animable matter brought in by the common Hony-Bees after the very ſame manner as the Hony-Bees are, but with a different animable or generative matter, and in a different matrix, there being in every Hive one or more Drone Combs made by the Hony-Bees with larger and deeper Cells for that very purpoſe, each Cell being compoſed exactly proportionable to the full magnitude of a Drone-Bee, which may be eaſily experienced by any one in obſerving the differences of the Combs in any Hive; but that the Drones are bred in their full magnitude is beſt ſeen in *May*, or *June*, by taking part of the Drone-Comb out of an Hive of Bees, for then any one may plainly ſee the Drone to be as large, having the exact form and parts of a Drone-Bee whilſt he is white, before he comes to full maturity, as he hath afterwards when ripe and fled: being bred without fangs as well as without a ſting; the Drones when come to maturity, thruſt off their waxen covers with their heads.

CHAP.

CHAP. VI.

The first Question answered.

Quest. *WHat mean you by generative, animable, or organizable matter?*

Ans. By generative, organizable, or animable matter, so often mentioned, I mean that peculiar and selected matter which being of divers sorts, is by every colony and stock of Bees so plentifully carryed into the Hive, all the spring and Summer time, which matter the Bees fasten on their thighs for conveniency of carriage, and they gather it with their fangs off of almost all sorts of vegetables: as trees, plants, Flowers, *&c.* which generative matter by the plastick power, and active quality residing in the sperm of the King-Bee is made use of for the augmentation of the severall parts of the *Fœtus*.

Many persons when they see the Bees laden with this generative matter, think it to be wax, and others think it to be Bee Bread, or food for the Bees to eat, although it is neither the one nor the other, but only that matter which makes the corporeal part of each Bee; and whether the Hony-Bees gather it as it is, or whether in their gathering and mixing of it they add any feminine vertue to it or not, I will not certainly determine; but this I know, that this generative matter thus by them collected

collected and put into the Cells, and alſo duly mixed with the ſperm of the King-Bee and ſtopped up, produceth each Bee, and the ſame generative matter without the ſperm of the King Bee therewith duly mixed, produceth not a Bee, which is plainly proved, by ſo much of that generative matter ſtopping up ſeverall Cells in divers Combs in many Hives, but eſpecially old ſtocks into which Cells the King Bee happened to miſs injecting his ſperm; for in caſe of the want of the King-Bee's ſperm among this generative matter, as when he miſſeth a Cell, or injecteth twice in the next, this matter, though in the Cell and ſtopped, yet never animates, but abides ſtill ſtopping up thoſe Cells whereinto it is put, which matter ſo inanimated; and ſtopping up the Cells, is called by ſome Sandarack, by others Bee-bread.

This generative matter (whether it abides ſtopping up the Cells, or whether it is animated, having the ſperm of the King-Bee mixed with it, or not) that it is not Bee-bread I conclude, becauſe Bees that can fly eat not of it, for I have ſeen much of it among the Combs of ſuch ſtocks as have dyed through overſwarming themſelves; the Bees of which ſtocks would not have been ſtarved for want of food if they could have eaten this matter. Alſo when a ſtock is robbed, you may find this generative matter in ſome of the Cells, which the robbers would carry away as well as the Hony, if it were food.

Alſo, the young Bees in embryo, and afterwards

wards when they are Maggots, cannot possibly feed of it any otherwise than the Chick in an Egg doth, for they are alwayes kept close stopt up with their waxen cover from the time of the first mixture of this generative matter with the King-Bee's sperm, until the Bee opens his own way out, which any man who listeth may experience by taking a Comb out of an Hive of Bees in the spring when first the Bees begin to breed.

The reason why there is so much of this matter stopping up the Cells in the Combs (especially in old stocks) is because the King-Bee sometimes misseth injecting his sperm into every matrix or Cell as he walketh, and so this generative matter for want of his sperm (though ordered by the Hony-Bees, yet) never animates but abides in the matrix or Cell, because the Bees cannot get it out.

That this generative matter is not wax, the colour distinguisheth; for wax is pure & white, when the Bees gather it, otherwise by washing and cleansing it only, we could not make yellow wax, so white as wee see our white wax is, though made of yellow wax; but to make white wax yellow, or any other colour, it cannot be done, but by addition of somewhat else to it, except by age; for it is the age of the Combs, together with the contiguity of the generative matter, and the heat of the Bees that changes the colour of the wax in the Hive, and turns it from white to yellow, and sometimes reddish, and almost blackish.

But this generative matter, when the Bees gather

gather it, is of all colours, according to the ſeveral colours of the vegetables, from which the Bees gather it; as orange, reddiſh, yellow, ſad colours, and the like.

Alſo any man may eaſily convince himſelf that it is not wax by taking a little of it off the Bees thigh, and holding it to the fire; for the wax will then melt, but the generative matter will crumble or grow hard with the heat; and further, we ſee that all old ſtocks gather of this matter plentifully, when their Hives were quite filled with Combs ſome years before, ſo that they can diſpoſe of no more wax in the Hive than what covers the Cells of the Combs; and ſwarms carry in very little or none of this matter untill after their Combs are built, and they begin to breed young.

CHAP. VII.

The Second Queſtion anſwered.

Queſt. *HOW comes it to paſs, if the King-Bee is a Male, and the only Male in every Colony and Hive of Bees, that he by his only Sperm produceth not only King-Bees like himſelf (which may eaſily be granted) but alſo common Honey-Bees with ſtings, and Drones without ſtings, both Different ſorts, and neither*

neither of them like himself, nor like one another?

Answ. First; his seed being the Principle of life; in it is that *ens sine quo non* of all the Bees, or thus; in that Sperme lies that vertue without which no Bee can be bred, and that it produceth those several sorts of Bees, it is from the maternal part of the Bees, which is the greater in quantity as is both the yelk and the white of the Egg to the Cocks tread, which alterative vertue lies in the several sorts of generative matter by instinct gathered from those several sorts of vegetables from which they gather it, which being by the Bees duly gathered and mixed, have such vertue as to conduce to the end of the several forms & distinct natures of each Bee; and generative quality of the matter, not losing, but rather increasing its vertue by their gathering of it, and afterwards by their due mixing of it, and constant heat administred to it.

I answer, Secondly, That those several sorts of Bees are produced from the King-Bee's Sperme only, by reason of that instinct given to the Honey-Bees to prepare different Matrixes to receive and retain his Sperme, and different sorts of generative matter to commix with his Sperme, which produces those several sorts of Bees: as we see by this example following, *viz.* That an Hee-Ass (by the help of different matrixes) begets a Mule and an Ass; so also one sort of Doggs meeting with various receptacles, do beget abundance of Doggs of another and different sort from themselves.

CHAP.

CHAP. VIII.

The Third Queſtion anſwered.

Queſt. IF *Bees have room enough, and are not killed, as in Colonies, will they not increaſe to ſuch prodigious numbers, that there will be too many?*

Anſw. That it is not poſſible to have too great numbers of Honey-Bees in a Colony (if there happen to be too many Drones, they may be eaſily killed, by leſſening the room, for then the Honey-Bees will kill them) becauſe the King Bee can lay his ſperm but in ſuch a circumference, and therefore the Bees in Straw-Hives are ſo ſtraitned for lack of room, becauſe the King-Bee muſt have room to lay his ſperm, and thence wanting room to lay Honey in; for a remedy they are forced to ſwarm, and ſo diſ-joyn their labours, which are united in the Colony; and for this cauſe, Bees kept in Colonies are alwaies ſtronger, and more in numbers than thoſe kept in Straw-Hives, and yet are not too many; for the more Bees alwaies produce the more Hony; and I have often ſeen, that three pecks of Bees in one Hive have gathered more Hony in one year, than a buſhel of Bees hath in two Hives.

CHAP.

CHAP. IX.

The fourth Question Answered.

Quest. *WHich is right Virgin-Honey? for if wee suppose that swarms and casts only do produce Virgin Hony, then Stocks and colonyes (which must needs be old because they dye not) will yield none.*

Ans. The ignorance of many Country people not knowing which is right Virgin-Hony, and which is not, is the cause that there is so little right to be had; for they generally think that all the Hony which comes from a swarm and cast, is Virgin-Hony; and that there is none in Stocks, when the truth is not so; for a young Stock hath Virgin-Hony as well as course Hony; and the Honey in a swarm or cast is often made as course as some in Stocks for want of due separation, because they also may have course Honey as well as fine.

To know which is right Virgin-Honey, you must consider that the generative matter and sperm duly mixed in each particular matrix or Cell, produceth a Bee, and every Bee that is bred leaveth a little drossy substance, sticking to the wax in the Cell from whence he came, which makes the Cell foul; and the more Bees are bred in a Cell, the more filth is contracted in that Cell, until in time some combs will be quite black; this filth infecting the Honey (afterwards put into such Cells, and abiding therein

therein) with droſs. Another cauſe of courſe Honey is, when this generative matter is put into any Cell, and the King Bee happens to miſs, injecting his ſperm thereinto, then that Cell abides ſo ſtopt; and for want of his ſperm among the generative matter, it never animates, nor is converted to any form, but abides ſtill, ſtopping up the Cell; and this matter (called by ſome Bee-bread) being among the Hony, is not eaſily ſeparated; and this generative matter ſo ſtopping up ſome Cells, togeher with the young grubs careleſly ſuffered among the Hony, makes moſt of it ſo courſe as it is. For when Hony-gathering is plentifull, the Bees fill thoſe Cells firſt which are empty and uppermoſt, and ſo they come down lower and lower with their Brood and Hony, as faſt as the young Bees empty their Cells by opening their way out, in order to their flying abroad, and ſo leave that generative matter among their Honey above, becauſe it growing hard they cannot eaſily get it out.

Now as thoſe are Virgins in nature which never knew male, or brought forth young, ſo thoſe only are right Virgin Cells among the Combs in which never any Bee was bred, nor any ſperm injected by the King-Bee, nor any generative matter layd and put in by the Honey-Bees, and conſequently that Honey which is put into thoſe Virgin Cells, and kept ſeparated from the other Honey in thoſe foul Cells where Bees have been bred, is right Virgin Honey and no other.

And if this Virgin Honey be not ſeparated,

cut off, and divided from the other part of the Comb wherein Bees have been bred, but ſuffered to run out altogether, then the common Honey in thoſe Cells wherein Bees have been bred, makes the true Virgin-Honey courſer; for, ſwarms and caſts breed young Bees as well as old ſtocks; ſo that for want of this care in ſeparation, the Honey taken from a ſwarm may be ſometimes as courſe as ſome in ſtocks.

And herein the keeping of Bees in Colonies hath much the advantage of the old method in ſtraw-Hives; becauſe the Combs never wax old, and the Virgin-Honey is eaſier ſeen and ſeparated from the other; beſides, the Bees delighting in cleanlineſs, are not offended with their Combs, as it often happens in the old method by reaſon of that quantity of generative matter ſtopping up many Cells in old ſtocks; for it is only the age of the Combs which makes a ſtock of Bees old, and not the age of the Bees themſelves; the Bees in a ſwarm being as old as the Bees in a ſtock that hath ſtood ten years together; the reaſon is, becauſe the old Bees goe forth in a ſwarm for directions, and the young Bees ſtay behind for ſtrength and defence; beſides, the Bees breed and die apace, and ſo ſucceed one another; but the age of the Bees themſelves is no damage to the ſtock, becauſe they work as long as they live, though it be three or four years, and never leave off working as long as they are able to fly; and for one Bee that dies with age, five will die by accidents of bad weather. A Colonie need

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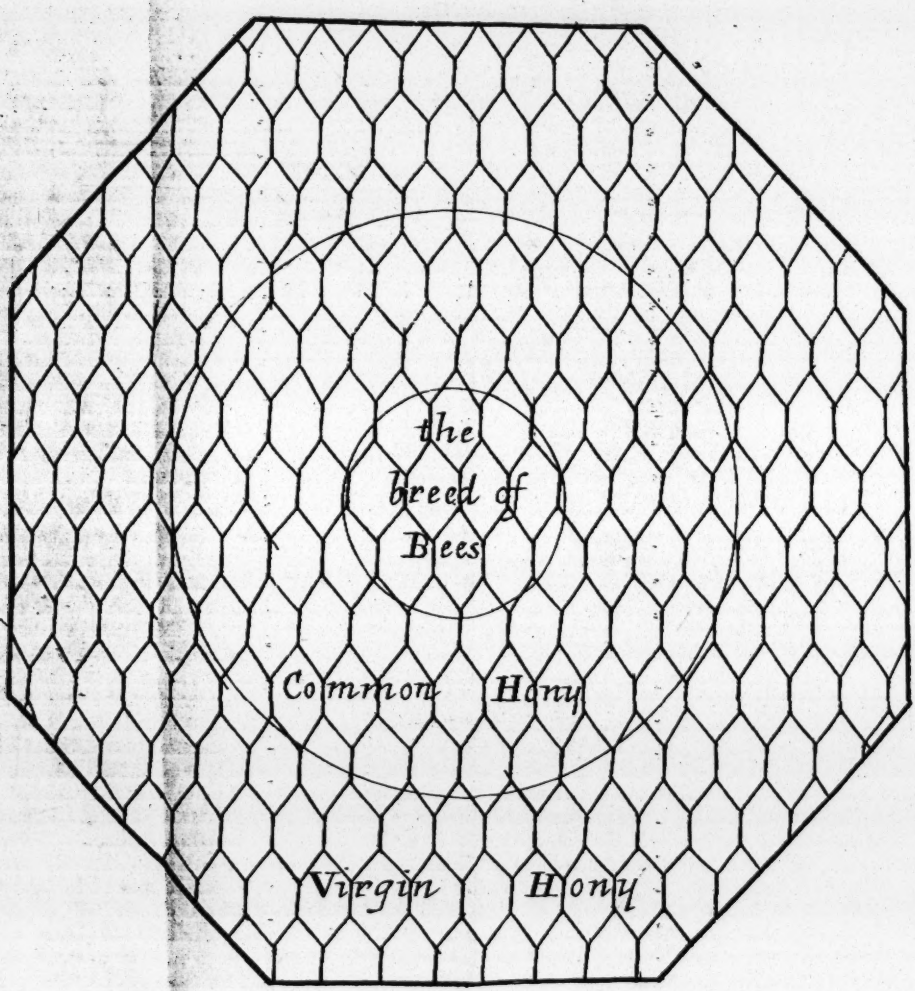


need never be above two years old if they ſtand but in an indifferentplace. I my ſelf have ſeveral Colonies to be ſeen by any that deſire it, not far from *London*, which have ſtood above four years, from which I have yearly taken off Honey, and yet the Combs now are of the ſame age as a this years ſwarm in *May viz.* now juſt three months old.

CHAP. X.

Of a Stock of Bees and how to Order them in Straw-Hives.

A Stock of Bees is a company of Bees conſiſting of three ſorts before deſcribed, *viz.* A King-Bee, great numbers of common Hony-Bees, and ſome Drone-Bees: being called a Stock of Bees becauſe they are a company congregated within themſelves, and ſubſiſting upon their own Stock, having gotten by their own labour & induſtry a competent meaſure of food to maintain them the whole Winter and(while they can gather none) until the next Summer, and alſo a competent number of Bees to preſerve themſelves and keep one another warm in cold weather. For, as I take it, every induſtrious man may be ſaid to live on his Stock while he cannot exerciſe his function, and thereby is forced to live upon his acquired Stock ſix Months to-

gether or until the return of a better ſeaſon.

Thus a ſwarm in *May*, or *June* is called a Stock at *Michaelmas*. And thus every company of Bees, though in a Tree or cieling of an Houſe, may be called a Stock of Bees; but the ordinary Hives or Houſes in which Bees are preſerved and attended, are made of Straw, from whence the Country man and ſuch as content themſelves with what is eaſy and cheap, do gather the profit they look for from the labour of the Bees. I do therefore to ſuch, give only the inſtructions following; which contain all that can be well directed in the uſe of Straw-Hives; and I ſhall afterwards ſhew the difference between thoſe uſual receptacles of Bees, and the Houſes and Boxes which have been lately invented and improved under the name of Colonies; which do not only raiſe a greater conveniency and benefit to the Maſter, but give him the pleaſure and the entertainment of ſeeing the Bees work, and in what condition his Colonies are from time to time.

The inſtructions for the ordering of Bees in Straw-Hives I ſhall briefly ſhew according to the ſeveral ſeaſons of the Year, beginning in *February*, and ending with *October*, becauſe all the Winter from *October* to *February*, they are beſt ſtopped cloſe up, except only a mouth paſſage for air; obſerving in general, that according as the Spring is forward or late, ſo ſooner or later are the Bees to be ordered; remembring alſo all the Year long to keep

keep the Hive close stopped up so that the Bees may have no passage out or into their Hive any where but at the Mouth only. The best stopping for them is Morter or Lome, mixed and tempered with ashes, and ashes sprinkled round over it, and on the top of the Hive, especially under the hackle or straw cover.

In *February* as soon as the weather and spring permits, let your Bees have their winter mouth cleared so as the Bees may not be obstructed in flying out and in; for in this month the strong stocks will begin to work.

In *March* open the mouth of your Straw-Hives a little according to the quantity of Bees in each Hive, and in the evenings once or twice in the month lift them off from the stool or place whereon they stand, and make clean the stool or floor of their Hive, by sweeping away what filth may be there contracted in the winter. In this month also begin to feed where need is.

In *April*, open their passage wider according to their strength, and in the evening two or three times this month, according as you find your Bees in strength (for weak stocks require more attendance and care to look after them than strong stocks.) Turn up the Hive and look into it, and cut away all those Combs which are dry or crumbling, or have any filth resembling small cobwebs in them; and if you have any old stocks that thrive not well, cut away their black Combs in the middle part of their Hive neer half way from the bottom

of their Hive. For the keeping the Bees thus clean and free from duſt and vermin, as moths Maggots &c. doth very much incourage them, and eaſe them of much labour, eſpecially in the ſpring, until their Hives are filled with Bees. Alſo continue to feed ſuch poor ſtocks as have need.

In *May* and *June* let your Bees have door room enough that they may not be two much crouded. Alſo attend and expect your Bees to ſwarm.

Concerning the ſwarming of Bees I have already treated in the ſecond Section; therfore ſhall be here very brief. You may in part know when your Bees will ſwarm, which is ſoon after they are filled with Bees, and fitted. But the ſooner to enable them to be filled and fitted, and conſequently to ſwarm, I adviſe to keep them with as great numbers of Bees as you can; in order to which I adviſe you to uſe no Hives that hold leſs than three pecks: The beſt ſize is ſomething above. Alſo I adviſe caſts and ſecond ſwarms to be all put back again to their own Hives from whence they came, for ſeldom any of them come to good unleſs two or three of them are united. And beſides, they do more hurt and damage to the ſtock out of which they came, than they themſelves are worth when kept. And if they riſe two or three times, put them as often back again to their old Hive on the ſame manner as the Bees are put to their Colonyes when taken off, which I ſhall deſcribe in the 16th chapter enſuing. And if you take their King Bee from

among

amongſt them (which then may be done as in the ſame 16th Chapter enſueing is ſhewed) they will not then be ſo apt to riſe again. The reaſon why I adviſe ſecond ſwarms to be thus put back again, is becauſe the ſtock will then be much the better in the next Spring, becauſe it will be both ſtronger in Bees, and richer than it could poſſibly have been if the ſecond Swarm had been kept from it, and conſequently be the ſooner filled with Bees, and fitted to ſwarm the next year, by this means alſo you may avoid the having any poor Stocks, unleſs only in very bad years, or when they over-ſwarm themſelves.

When your Bees are ſwarmed, Hive them into an Hive ſo dreſſed as I ſhall direct in the 9th. Chapter enſuing, and ſet them the ſame night where you intend they ſhall ſtand.

In *July*, narrow their paſſage, and poize them to know their ſtate, and likewiſe beware of robbers, eſpecially after the middle of the month.

In *Auguſt*, make their paſſage narrower, as I ſhall direct in the 19th Chapter of the next Section concerning robbing. Likewiſe take up all ſuch as you find either very heavy, or very light; I mean ſuch as are very full of Honey and have but few Bees, and ſuch as have not probably a ſufficient quantity of Honey to ſubſiſt ontill the next Summer.

Concerning the robbing of Bees, which is chiefly in this Month, I ſhall treat of it in a Chapter by its ſelf, *viz.* the 19th. Chapter enſuing.

In *September* is the beſt time to feed ſuch Bees as you intend to keep, and think that they have not a ſufficient ſtore of their own.

This month alſo, and the next are very good times to remove Bees.

In *October* look well to their winter quarters, that cold, wet, and vermin, offend not, nor deſtroy them. As for their ſtopping up, I refer you to the 19th *Chapter* enſuing, and as for their diſeaſes, or accidents, I refer you to the 20th *Chapter* enſuing.

The differences of keeping the Bees in ſtraw-Hives, and Colonies, are negatively; not in any change in the natures of the Bees themſelves, nor in their government: but affirmatively.

Firſt, In their breeding as to the form; which I ſhall ſhew in the 15th. Chapter enſuing.

Secondly; In their ſtrength, becauſe of their greater numbers; and.

Thirdly; In their riches, by reaſon of their union.

Fourthly; Both in their ſtrength and riches, becauſe none of the Bees are killed.

Fifthly; In their profit, which is really more than double, (as I ſhall prove in the laſt Chapter of this Book) by reaſon of their being well ordered; as this Book directs.

Sixthly; In their ſafety, (as I ſhall ſhew in the 20th. and 21th. Chapters of the next Section) becauſe they are better preſerved from their enemies, and occaſions of their

Laſtly;

Laſtly ; In the goodneſs as well as in the quantity of Honey taken from them, being almoſt all Virgin-Honey.

All which, with the continued advantage of yearly profit, without the cruell deſtruction of ſo good ſervants, and without further expence. and without continual attendance all the time of ſwarming, will quickly recompence the charges of ſetting them up in Colonies.

But more clearly to evince the verity of what I have herein aſſerted, as well concerning the profit and advantage of the Colonies, as the goodneſs of the Honey, I ſhall (as long as I live) every year keep by me ſome of my box-Hives, which I yearly take off my Colonies, to be ſeen by any that ſhall deſire it, that will but take the pains to come to my dwelling-houſe, being an Apothecary's ſhop in the Bowling-Ally in *Weſtminſter* (as is before-mentioned in the preface.) The time I ſhall keep thoſe Colonies (ſo taken off every year) to be ſeen, will be two whole months, *viz.* from the firſt day of *Auguſt*, until the laſt day of *September* ; for the Honey will not keep good much longer becauſe of ſome grubs in the Hive.

Alſo I intend conſtantly to keep by me ſome ſtore of right fine Virgin-Honey where-with to furniſh any who are ſo exact and curious as to have the right and beſt ſo ſeparated from the courſe-Honey, as it ought to be, becauſe whoever ſends to me for it may not be diſappointed, but have that which is true and right.

To

To conclude this ſection; I intend alſo to have all the month of *September* right Virgin-Honey in the Combs of the ſame ſort of that Comb which I preſented to His Majeſty at Dinner in *White-hall* in *October* laſt, which was eight Inches long, and five Inches broad, to furniſh any who deſire to ſee ſuch curious works, or taſt ſuch pleaſant food which is the true Nectar, and rightly called heavenly food, becauſe it comes from Heaven in an Honey-Dew, though the heathen report it to be the food of the Gods, becauſe *Jupiter* being fed by Bees, muſt needs eat Honey: which he liked ſo well, that afterwards the Bees were made the Muſes Birds.

Section 4.

Of Ordering the Colonies.

CHAP. I.

Some general things, by way of Advice, to be obſerved by all thoſe who already have, or intend to keep Bees in Colonies.

I. THat Bees are indocible creatures, and therefore their own natures muſt be obſerved and followed ſo that they may be lead (as they are in this method) to improve their induſtrious labours double to their owners advantage; therefore they who keep Bees thus ſhould be very exact in obſerving the following directions in this Book, which are written upon large experience.

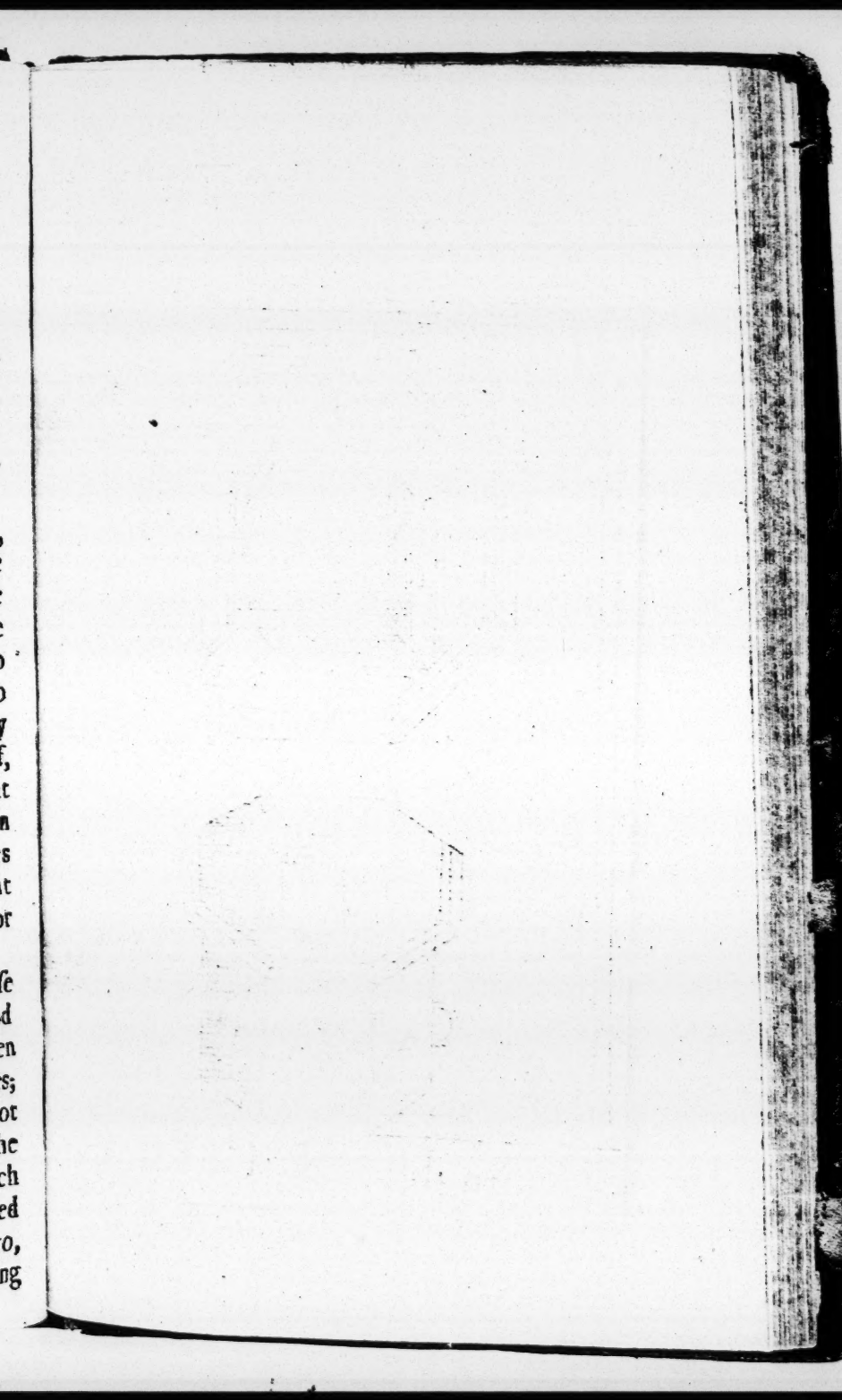
II. That they ſet their Bees in the Bee-houſe to furniſh their houſes with Colonies as ſoon in the ſpring as they can; for by how much the ſooner in the Spring they are put into the houſe, by ſo much the better the Bees will be acquainted with their new ſtation. Therefore, next to the Spring, the beſt time to furniſh your Bee-houſe with good ſtocks, is in the fall, and then they will be the more ready againſt the next Spring. And if the Spring be far

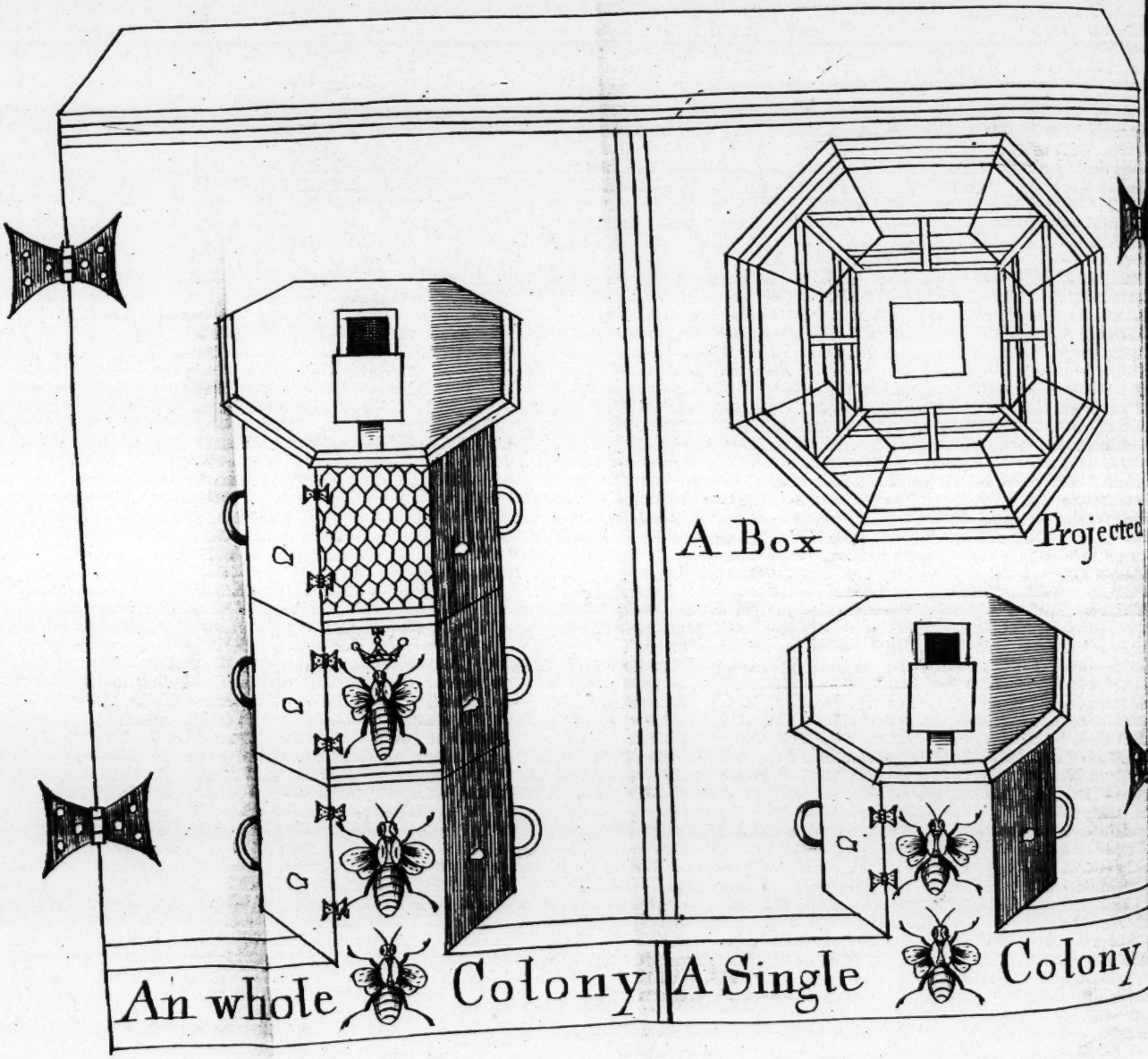
far ſpent. I adviſe to furniſh your houſe with early and large ſwarms as I ſhall ſhew in this Book.

III. That although Bees do not ſwarm in this method, yet if any man hath a mind to have an increaſe, he may let them ſwarm (for the Colony as well as a Straw-Hive will ſwarm if you forbear to raiſe them) which muſt be when you intend to forbear taking off an upper-box that year, as I ſhall ſhew in the 18th Chapter of this Section,

I V. That whoſoever ſets up this method, do firſt ſee a Bee-houſe made according to the patrern of His Majeſty's Bee-houſe in the Royal Garden : which is ſo exactly made according to the natures of the Bees, as to guide the Bees without any hindrance into their Hives ; otherwiſe there may eaſily happen miſtakes in the manner thereof, eſpecially in the front doors; and the ledg at the bottom, as ſome have found to their own loſs. And whereas there are ſeveral Bee-houſes in divers County's made according to that exact form, I ſhall direct thoſe that come or ſend to me where they may ſee them.

V. That they have examples of thoſe Hives I have laſt made, and had good experience in; otherwiſe miſtakes may happen and hazzard the thriving of their Colonyes; becauſe many Hives formerly made, have not been made right, but diſadvantagious to the Bees in their working divers wayes, which diſadvantages are all removed and amended in thoſe Hives I now uſe and adviſe others to, being




A Box Projected
An whole Colony
A Single Colony

being ſo much better than thoſe formerly made, and differing from them in ſix or ſeaven places of the Hive; as in the paſſages out of one Hive into another, in the little door on the ſide which is better left out, and in the ſliding ſhutter, and in the creaſes at the top and bottom of the Hive, in the windows, in the entrance of the Bees into and out of the *Hive*, and in the height of them. All theſe miſtakes about the form of the Hives have happened, becauſe moſt of them were made by falſe patterns of ſuch who were not experienced in the uſe of them. And for remedy thereof I keep conſtantly ſome by me, ready made and fixed, to furniſh any who deſire them, at my houſe aforeſaid (in the preface) in the Bowling ally in *Weſtminſter*.

CHAP. II.

The Deſcription of a Bee-Houſe.

BEfore we come to order the Colonies of Bees that ſo we may enjoy the Fruits of their labours without killing the Bees themſelves; I think it beſt to give a general deſcription of the Bee-houe, of the boxes or Box-hives, and of the method of ordering the Bees and Colonies. I ſhall deſcribe only an houſe for four Colonies of Bees which is the moſt convenient, by which according to the

ſeveral

ſeveral dimenſions and proportions a workman may contrive an houſe for two or three, or ſix, or eight. The houſe for four Colonies is thus.

The length from outſide to outſide ten foot, the breadth from outſide to outſide two foot and a half: The houſe may be made with any boards, and you may make it with ſmall poſts in the corners.

Let the floor be made ſtrong, cloſe, and even. And the houſe made to ſtand ſo ſtrong that the wind blow it not down; a good way to make it ſtand faſt is to faſten four ſparrs to the four corner feet of the houſe, having driven them firſt a pretty way into the ground.

Let the floor be a foot or better from the ground.

The diſtance from the floor to the plates four foot.

The front doors three foot and an half high, with a board over to reach to the plates, under which board the doors may ſhut cloſe, and an upright in the middle for the two front doors to ſhut cloſe againſt in a ravet.

Let there be a ledge one inch and quarter thick, and two inches broad to be nailed faſt down under the front doors, with a ravet in it for the doors to ſhut over. Underneath through this ledge are to be cut, at equall diſtances, four holes, halfe an inch high, and five inches long, for the Bees to go in and out under the doors through thoſe cutt holes into the box-hive, and not into the houſe. For the mouth of the box-hive is to ſtand cloſe to, and

anſwer

anſwer that hole or entrance ſo cut in the ledg, and let the bottom of the front doors be even to ſhut cloſe in the ravet made in the upper part of the ledge.

You may let the floor reach four inches without the front doors, for the Bees to alight and reſt upon, and plain it ſloping from the ledg to the edg, that the rain may fall off on the ground.

Let the back doors be as high as the roof will well ſuffer them, but as large as to take out a Colony when need is.

The houſe may be covered with any thing to keep out wet; the beſt way is to make the roof ſo that the rain may not drop off on the Bees comeing home. If you make it with rafters for the rain to fall both wayes, then nail a ledge ſloping upon the front to carry the water ſo that it may fall at the ends of the houſe.

Make your houſe ſo cloſe and tite that it may very well keep out cold, wett, and vermine. And let the front ſtand as neer as you can to the South, or a very little bending to the Weſt, and place it ſo that you may open the back doors with eaſe.

The houſe thus made and placed hath this happy advantage, that it keeps the Bees warm in the dead of winter, ſo that the moſt violent froſts do not deſtroy the Bees; eſpecially if you cover the boxes in the houſe with looſe Straw or hay. And in the ſpring by reaſon of the front doors ſtanding always to the South Sun, they receive all the impreſſions of the warmth

warmth of that Sun, and it keeps off the fierce *March* winds (which are commonly North and East) from diſſipating the impreſſions of the aforeſaid heat of the Sun in the houſe, like a Melon-glaſs. As alſo it keeps in the natural heat of the Bees, which affects the houſe with warmneſs, which heat, together with the impreſſions of the Sun upon the foredoors, is ſo preſerved by the cloſeneſs of the houſe, that after a cold frosty night in *march* or *April*, open but a back-door, and put in your head, & you ſhall find it warm as a Stove, and conſequently by its continual heat haſtens the hatch of the young brood of Bees. And in Summer, by opening the back-doors there comes in a freſh Air that diſſipates the exceſſive heat in the houſe; and conſequently all reſults in this, that the houſe keeps them warm, when the weather is too cold, and keeps them cool, when the weather is too hot.

CHAP. III.

The Deſcription of the Boxes, or Box-Hives.

THE Boxes, or Box-Hives may be made with any boards, but firr is beſt, becauſe it being ſpongy, receives and ſucks up the breath of the Bees in the cold weather, which breath is not ſucked up by Oaken Hives, and then

then it abides on the inſide in cold weather, and ſo affects the Hive with coldneſs, which may be avoided by making the Hives with deal or firr boards.

The form is octagon or eight ſquare, which being near to roundneſs, is much better than to have them four ſquare, becauſe the Bees lying in a globulous body in the center of the Hive, are thereby the neerer to the circumference in this form as well as in round Hives, but in four ſquare Hives they would be more remote from the corners, and the conſequence would be that the Honey in the corners would candy and thereby become uſeleſs for the Bees in the Spring, which in this form is avoided by their propinquity to it, whoſe naturall heat keeps the Honey from being candied or curdled, in the Hive.

The heighth of the Hives is ten inches from the top to the bottom on the out ſide, and ſixteen inches over from outſide to outſide with a fliding ſhutter to run eaſily in a grove in the middle of the top, backwards over the back window; this ſhutter is to cover an hole five inches ſquare in the middle of the top of the Hive, alſo in the Hive are two large glaſs windowes, one before, the other behind, with doors to cover the glaſſes. And two handles, on each ſide one, for lifting them up; a ſmall paſſage a little above halfe an inch high under the glaſs window in the front, for the Bees to goe in and out at, as at a door: alſo a frame in the inſide made faſt with four pins for the

Bees to faſten their combs upon. But I adviſe all perſons to refrain making of them without a true pattern, eſpecially whilſt they may have them at the Authors houſe (mentioned in the preface) at as reaſonable rates as any where elſe (except their carriage) or at leaſt they may be informed by him where ſuch Hives are, as be made right.

CHAP. IV.

The Method of Ordering the Bees and Colonies.

THE Box-Hive being placed in the houſe with the ſliding ſhutter open, and a good ſtock of Bees placed on the top: this ſliding ſhutter is left open for a line of comunication, becauſe the Bees have no other paſſage but through the Box to go out and in at the bottom, and that they may fill the ſaid box as part of their Hive without ſwarming, which when they have performed in a great meaſure, another Box is to be put under them with the ſhutter open, and when that is pretty well filled according to the manner and ſeaſon hereafter mentioned, to ſhut the ſliding ſhutter that is next under the upper Hive or box and ſo take off the uppermoſt at the time hereafter mentioned, and never after to uſe any Straw-*Hive* again; and when the

the lower Box of the two that are left, is ſo full as to endanger ſwarming, then put a third under; and according to following directions take off the uppermoſt, ſo that thus you have a circulation by three Boxes, of a perpetual vacuity to prevent ſwarming, and a perpetual taking away of *Honey* without the Bees deſtruction, for what Bees may be in the upper box when taken away, will, when diſcharged repair to the mouth of the Colony from whence they were taken (being their old paſſage) and ſo are preſerved. Some few perſons diſaffected to any invention found out in the age they live in, have caſt ſome blots on this method becauſe ſome who kept colonies ſuffered them to miſcarry through miſmanagement, and miſtakes in the forms of the Bee-Houſe and boxes, which miſtakes are mentioned in the firſt Chapter of this fourth Section and may be avoided chiefly by the boxes being made right,and wholly by the houſe with the ledge made right, for the guiding the Bees into their Hives: And the miſmanagement may be avoided by a carefull following the directions this Book will afford; for many perſons who have already taken my directions which follow, and were carefull to obſerve them, whoſe houſes and Box-Hives were right made, their Colonies did, and ſtill do thrive to admiration, as hath already appeared, and will further appear by the great increaſe of Honey which they yield every year: which any Gentleman may ſee, that will but take the pains to come to my

houſe, any time from the begining of *Auguſt* untill *Michaelmas*; for all that time I intend every year to keep ſome of thoſe Box-Hives which I yearly take off my colonies to be ſeen (as I mentioned page 53. of this book) that by the ſight of them, all perſons willing may be fully ſatisfied not only of the profit in this method beyond what can be in the old method of Straw-Hives, but alſo of the admirable workmanſhip of the Bees which is very delightful to behold.

CHAP. V.

How to order the Bee-houſe.

AN houſe is abſolutely neceſſary in this Art, without which it is in vain to begin with the method of colonies; for the ſun ſhining on the Box-Hives hath more influence, and cauſeth greater heat in the inſide than it doth ſhining on a Straw-Hive, becauſe the Straw Hive is more porous. However Straw-Hives are not ſo fit for colonies, becauſe in time, they will yield one way or other, ſo that the combs which cannot be ſo ſtrongly fixed in Straw-Hives as Box-Hives, will become pliable and bending, ſo as in the taking off the Upper-Hive they may be thruſt together; and if ſo, the King-Bee as well as any other Bees, in either of the Hives may

ſoon

ſoon be bruiſed or cruſhed to death. Therefore are the Hives made with whole Deal, and for the cauſe aforeſaid, *viz.* the ſuns influence, the foredoors muſt be ſo kept ſhut as the following directions do ſhew.

But if ſome will be ſo frugal, an houſe may be made from a wall like a penthouſe without any back doors; the greateſt detriment will be, that their owners cannot ſo well ſee to inſpect their Bees behind, if the houſe be made from a wall, then let there be doors at the ends as well as before which will ſupply the want of them behind in a great meaſure, being to be opened as the back doors of another houſe are, and let the roof come further over; ſo far as the rain that falls may not fall upon the board where the Bees alight, aud let rhe floor be ſo much broader than the other that a man may walk behind the Colonies, the better to inſpect the Bees, and to drive the ſliding ſhutter home, when their Honey is to be taken. You may let the floor be four or five foot broad from the wall to the outſide of the front-doors, this houſe will be as well thatched as tyled, the front-doors muſt be made juſt as thoſe in the houſe before deſcribed.

In ordering the Bee-Houſe remember conſtantly to keep the fore-doors ſhut as well in Smmmer as in Winter, and as well in the day time as in the night; for they muſt be always kept cloſe ſhut, except only at ſuch times and whilſt you inſpect your Bees, or put Boxes under, or take away a Box, or clean the houſe,

but no longer at any time than needs muſt, eſpecially whilſt the Bees are at their work.

For, if the fore-doors are left conſtantly open in the Summer, the Sun ſhining hot upon them will melt their Combs and make the Bees miſlike their Hives and ſwarm, or make their Combs only in the back parts of their Hives: And if the fore-doors be kept ſhut at ſome times only, and at other times left open, the Bees will not readily find their way, which will very much hinder their working, and alſo cauſe the Bees of ſeverall Colonies meeting ſo neer home to fight and kill one another. All which are prevented by keeping the fore-doors alwayes ſhut cloſe, except only as above excepted.

the Alſo back doors in the heat of the day in hot weather are to be opened to let in the cool Air, which will refreſh the Bees, and at other times keep them alſo ſhut, except at any time for inſpection. By theſe means you keep off the Scorching heat in Summer, and the violent cold in winter, and in the ſpring, the heat of the Sun ſhining on the fore-doors together with the ſteam and warmth of the Colonies in ſo cloſe an houſe, excedingly haſtens their breeding, as glaſſes ripens melons.

CHAP. VI.

What Bees to furniſh the Houſe withal for Colonies.

TO furniſh the Bee-houſe with Colonies take the beſt Bees you can get, that is ſuch as are in very good caſe, which are beſt known by the weight of them, and by the great numbers of Bees, and the fulneſs of the Hive with them: there is little other difference among ſtocks of Bees. If you put light ſtocks into the houſe, they will not be fitt to be ſet up upon a Box-hive in one whole year; and if ſo, you had as good not put them into the houſe; beſides, ſuch are in danger to be robbed by reaſon of their paucity of Bees, therefore put into your Bee-houſe only heavy ſtocks, and ſuch as are alſo full of Bees; for ſuch ſtocks only, are fit to make Colonies, and will not deceive your expectation in their working into the Box-hives when they are raiſed and put on them, accorditg to following directions.

CHAP. VII.

How to furniſh the Houſe with Bees.

HAving provided good Bees, put them into your houſe, with the old mouth of the Hive againſt the place where the Bees entrance is into the houſe; and if you know not which is the mouth of the Hive, then look into it, and place the edges of the Combs North and South, and place the Hive ſo cloſe as to touch the ledge where their entrance is to be, then ſtop up the Hive with Lome cloſe round about, except their paſſage but eſpecially the ſides of their paſſage, ſo that no Bees may go out into the houſe, or any other way out or into the Hive but through that hole cut under the ledge of the front door, which is alwayes to be the mouth of the Colony: You muſt place the Straw-hive thus into the houſe upon the floor without any Box-Hive under it, becauſe the Bees muſt be well acquainted with their way into and out of their Hive before they are to be raiſed up, and ſet upon a Box-Hive, for, whilſt the Bees are weak, or feeble for want of numbers, and untill the Straw-hive be full of Bees, the ſetting them up upon a Box hive not only gives them much unneceſſary labour, but alſo expoſes them to robbing, beſides, many of the Bees will loſe themſelves becauſe unacquainted with their new ſtation.

CHAP.

CHAP. VIII.

When to furniſh the Houſe with Bees.

THE times when theſe Stocks are to be thus placed into the Bee-houſe, are in the Spring and fall: the beſt and fitteſt times are in the Spring till *Aprill* if the year be forward, and untill the end of *Aprill* when the year is backward; and in the fall from the beginning of *September*, until the end of *November*, if it be not froſty or ſnowy weather: the winter is indifferent, when the weather is neither froſty nor Snowy; but in *May*, *June*, or *July*, if Bees are removed, their working is hindered to great loſs, becauſe moſt of the Bees will reſort to the place from whence they were brought. And if Bees are removed in *Auguſt*, eſpecially in the beginning of the month they will be in very great danger of being robbed; and although I can remove them my ſelf in *May* or *June*, or any time before they have ſwarmed, with very little or no damage to them by taking a little more time to do it in: yet, unleſs you have ſo much Judgment in Bees as to hinder their reſort to the place from whence they were brought, I adviſe not to remove a Stock after the middle of *April* at the lateſt into the Bee-Houſe, leſt you thereby not only endamage them in their working, but alſo endanger

endanger the loſs of many Bees which will make them feeble, ſo that to prevent your Bees from miſcarrying, I adviſe if you have them not ready to be put into the houſe before the middle of *April*, then to wait for a good ſwarm in *May* (neer *London*) or *June* (further off in the Country) and ſo furniſh your houſe with a ſwarm hived into a Box-Hive, and if a good ſwarm be not to be had according to the directions in the next Chapter, then wait untill the end of *Auguſt* for a good Stock, which I adviſe you to place into your houſe in the fall according to the directions given before, and let it ſtand ſo alone all the winter without any Box Hive; for a good ſtrong Stock placed into the houſe at any time in the fall after *Auguſt* is expired, or early in the ſpring before the Bees work apace, is better to furniſh a Colony withall than a ſwarm, becauſe ſuch a Stock will fill one Box-Hive the firſt year, and if it be a very good Stock, and a very good Hony year, you may have a ſecond Box put under, and the Straw-Hive taken off the ſame year, as I have had ſome.

CHAP.

CHAP. IX.

How to order a Swarm to furniſh a Colony.

THE Box-Hive whereinto you intend to put a good ſwarm, is to be thus prepared; firſt take out the pins that faſten the frame in the Box, then take the frame out, alwayes obſerving to put it in again the ſame way, otherwiſe it may not fit the Box again; then faſten the ſliding ſhutter on the top to cover the hole cloſe, then dreſs the Hive and the frame by rubbing them with herbs, as fennell-tops, bean-tops, or elm leaves or any ſweet herbs: rub them all about in like manner as Straw-Hives uſe to be dreſſed: but of all the wayes to make the Bees beſt pleaſed with their Hives, I and others have found that an hogg muſling in an Hive hath been the beſt way of dreſſing it, which may be done by throwing in a few handsfull of peas, and let an hogg eat them out, I think I need not direct you to take heed that the hogg break not the glaſs windows, therefore a trencher or board put before the glaſſes may be a good way to ſave them: having dreſſed the Hive put in the frame again, dreſs the Box-hive thus: the ſame day that you have a good ſwarm to put in it, it will be beſt done a little before you Hive the Bees: if you dreſs not your Box-Hive, the Bees will not

not ſo willingly ſtay therein, becauſe they have been uſed to Hives of another form, and nature: and for want of thus ordering the Hive, ſometimes the Bees will all fly out again. Get as large and as early a ſwarm as you can, and having your Box-Hive ready prepared as above, ſhake them into the Box. The ſwarm being ſhaken thus into the Box, ſet it on a ſheet with the top uppermoſt upon the ground, tilting up one ſide a little, and cover the Box all over from the Sun as well the ſides as the top, except only where it is tilted up for the Bees to go in, and if any Bees fly to the place where before they ſetled then ſhake them into an empty Straw-Hive, and ſo bring them to the Box-hive, and knock the Bees all out of the Straw-hive upon ſome part of the ſheet juſt at the place tilted up for them to go into the box hive, and when they are all in the hive, towards the evening, place the hive into yonr Bee-houſe with the mouth of the Box-hive cloſe to the ledg where the hole is cut for their entrance, ſo that not a Bee can get out, or into the Hive but only through that entrance under the ledg of the front door of the houſe; and be ſure to keep the front doors cloſe ſhut, eſpecially the next day, and afterwards for a week or two, not ſo much as to open them to inſpect the Colony, unleſs before Sun riſing or after Sun ſetting. This way to put good early ſwarms into your houſe may be as well as a good Stock, provided you be ſure to put them into the Bee houſe the ſame night that they are ſwarmed, or at leſt

left the very next morning an hour before the Sun riſeth, otherwiſe you will find they will be much worſe than a good Stock, and as bad as a midling Stock that would not have ſwarmed in the old method that year.

The reaſon why a ſwarm muſt be placed ſo ſoon into the Bee-houſe, and the foredoors ſo ſhut, is, becauſe the very next morning after they are ſwarmed, the Bees do little elſe but learn to know their new habitation and the way to it, which they do thus: A Bee coming out of the Hive into the Sun-ſhine wipes his eyes with his foreleggs, then takes his flight not above three inches from the mouth of the Hive, and there flyes three times round; then he flyes further off and flyes thrice round again; and afterwards a pretty diſtance off, and fetches a large circumference three or four times, all this while taking notice, firſt, of the mouth of the Hive he came out, then of the places about it, and at laſt of the places about the houſe and garden where the houſe ſtandeth, after which, he flyes ſtraight away directly where his ſcent leadeth him, to gather what he wants; thus alſo every particular Bee taketh notice of his Station, when he firſt cometh abroad, and is newly out of his Cell. Therefore for a mark or ſign for the Bees, the better to know when they are at home, and to find their way, it may be convenient, and a good direction for them to paint or colour the Bee-houſe doors with ſeverall colours about

about and juſt over the mouth of each ſeverall Colony, as one red, another blew, or green or yellow, or any diſtinct Colours. When your ſwarm is thus put into the houſe, let it ſtand ſo untill the next ſpring to be rayſed as is herein ſhewed in the 13th Chapter of this Section.

CHAP. X:

When to put the firſt Box-Hive under the Straw-Hive.

YOur Straw-Hive being placed in the houſe according to the directions given before, let it ſtand ſo in the houſe, untill they have a tendency to ſwarm, that is, until the Hive is filled with Bees, which will be according to the forwardneſs or backwardneſs of the ſpring, and the ſtrength and goodneſs of the Bees themſelves, and the fruitfulneſs of the ſoil neer them, which will be ſometimes in *April*, commonly in the begining of *May*: now, as ſoon as you perceive the Straw-Hive to be filled with Bees, and not before, is the time when it is fit to be raiſed, and ſet upon the firſt Box-Hive.

The reaſon why the Straw-Hives muſt be left ſo in the houſe, ſome time before they are placed upon any Box-Hive is, becauſe the Bees, if not acquainted with their new ſtation, will

will loſe themſelves, and if they are preſently ſet upon an empty Box-Hive, then that diſadvantage is not only the greater by hindering their work, but alſo they are thereby the more expoſed to robbers: for when they are within the Box Hive they cannot preſently know that they are at home, being unacquainted as well there, as without the Hive and houſe, for when the Bees are well acquainted with their way, and mouth of their Hive on the outſide of the houſe, then if the Straw-Hive ſhould be raiſed on a Box Hive, the diſadvantage would be ſo much the leſs, though they were not full of Bees.

The reaſon why the Straw-Hives muſt not be ſet on the firſt Box-Hives untill the time that they are filled with Bees, is becauſe till then the Bees are not ready to come down out of the Straw Hive, and therefore it will hinder their work, for if the Bees are not ready to come down into the Box-Hive with their work as ſoon as they are placed thereon then they will have double labour to carry their generative matter & Hony through that empty Box-Hive, and not only ſo, but they will be in danger to be robbed becauſe the Bees will be at ſo great a diſtance from the mouth of their Hive, and the robbing Bees will have thereby an opportunity in that vacuity to hide and reſt themſelves from the purſuit of the true Bees untill they ſmell ſomewhat like unto them by their continuance ſometime there, whereby they have then an opportunity to ſteal Hony; all which diſad-

vantages

vantages are eaſily prevented, by letting the Straw-Hive ſtand ſo long as until the Bees fill the Hive to the bottom, and then to ſet the firſt Box-Hive under them, as followeth.

CHAP. XI.

How to ſet the firſt Box *under the Straw-Hive.*

WHen your Bees are in ſuch readineſs, as fit to be raiſed, then having the Box Hive ready dreſt as is ſhewed in the ninth Chapter of this Section, and obſerving to draw back the ſliding ſhutter on the top to leave the hole open; in the duſk of the evening lift up the Straw-*Hive* and make clean the bottom where the lome or ſtopping of the Hive hath daubed the floor, then ſet the Box-*Hive* down upon the floor with the mouth of it ſo cloſe to the entrance under the ledge of the fore-door that no Bee may go out on either ſide, or crawle about it, or into the houſe, then ſet the ſtraw-*Hive* down npon the Box-*Hive*, and place the old mouth of the ſtraw-*Hive* over the mouth of the Box-*Hive*, ſo that the edges of the combs may ſtand North and South, and then ſtop up very cloſe the mouth of the Straw-*Hive*, and round about the bottom of it, do it ſo cloſe that not a Bee may any way get

out

out of the Straw-*Hive* but through the hole where the ſliding ſhutter is, into the Box *Hive*, and let the *Box-Hive* ſtand ſo cloſe and even to the floor, and to the ledge under the front door, that not a Bee may get out abroad, or about the houſe, but what goes through that entrance under the ledge which then is, and muſt at all times be, the only mouth of the Colony for the Bees to paſs in and out at. For if you leave any holes or avenues open whereby any Bees can get out and in to either Hive except only their paſſage under the ledge, it not only cauſes ſome Bees to be loſt, but alſo endangers robbing.

CHAP. XII.

How, and when to put under the ſecond Box, whilſt the Straw-hive is on.

WHen the firſt Box, which is under the Straw-Hive comes to be ſo far wrought down (in the ſtrength of ſwarming time) that the combs and Bees fill up two thirds of the Box, then is the Colony to be raiſed, which ſtate of your Bees will be thus commonly in *June*, but ſooner or later according as the year is forward or backward; but when it is thus, which may be ſeen through the glaſs windows, then (unleſs it be late in the year when ſwarming time is

pretty well over) proceed to raiſe up that Box with the Hive upon it, and ſet under the ſecond Box (the ſliding ſhutter being open) as cloſe to the ledge and floor as you can, and in the very ſame place exactly, that the other Box ſtood in before, and ſet your Colony very even upon that empty Box, and then ſtop cloſe up that which was their old entrance under the forewindow of the upper-box, which will be open by being raiſed and ſet upon another Box : and ſo cauſe all the Bees to go out and in to their Colony through the nethermoſt Box, and ſo under the ledge of the door, being the old place of their entrance into the Colony. Great care and inſpection muſt be uſed in the heat of ſwarming time, to look when the box-Hive is neer full, and this ſecond Box to be ſet under, becauſe the Bees hatch great numbers of young together, and ſo will ſometimes fill it ſuddenly and then ſwarm, unleſs you put this ſecond Box under before the other is quite filled : and if you put this ſecond Box under too ſoon, that is, before the Bees breed young in the Box-Hive, then you cauſe the Bees to have double labour, and ſo you will thereby loſe the benefit of taking off the uppermoſt Hive that year.

CHAP.

CHAP. XIII.

How, and when to raiſe a ſingle Box, *or put under the ſecond* Box, *when the Straw-hive is off.*

WHen you have your Colony ſet up with a ſwarm in a Box without any Straw-Hive, my direction was to let it ſtand ſo until the next Spring; now this having ſtood all the Winter until the Spring, is in the ſame manner to be ordered as if a Straw-Hive had been taken off the laſt year, and afterwards the undermoſt or nethermoſt Box alſo taken away to prevent robbing according to the directions herein after ſhewed in the 17th Chapter: for then is left only that ſingle Box-Hive which was the middle Hive, in the Summer before, whether a Box Hive or a Straw-Hive had been taken off, as to the ordering the Colony that matters not. Thus you ſee a Colony, may be in a ſingle Box all the winter though of three ſorts; as firſt, a ſwarm Hived in a Box-Hive; ſecondly, the relict of a good ſtock when the Straw-Hive is taken off; and thirdly the relict of a good Colony that hath had ſeveral Hives taken off; theſe three ſorts of Colonies being Commonly, *Bonus*, *Melior*, and *Optimus*: for the longer Bees are uſed to be in Colonies, the more certain they are of thriving; but which ſort of Colonies it is of the three, it matters

not as to the ordering of them but only in the time; for if in a ſingle Box they are all to be ordered alike, which is like to the raiſing of a Straw-Hive as is before ſhewed in the 10th and 11th Chapters of this Section, to which I refer you: but in ſhort, for the plainer underſtanding of Country people who keep Bees, it is thus: In the ſpring when the Bees begin to work apace, towards the beginning of *May* inſpect your Bees through the glaſs windows; do this now and then, until there be occaſion to raiſe them, to know the time when, let it be as ſoon as you ſee the Box within, full with Bees, and if it be a laſt years ſwarm when the Box is filled within three inches of the bottom round about the edges of the Hive, for in the middle they will be alwayes neer the bottom. When the ſingle Box is thus full with Bees, then lift it up, and ſet under the ſecond box thus; place the additionall Box with the ſliding ſhutter open (whether it be quite empty, or if there be Combs in it) juſt in the very ſame place exactly as the other ſtood, eſpecially the entrance, and then ſet the Colony over it, as even as you can, and preſently ſtop the old place of their entrance which will then be open, I mean the paſſage under the fore-window of the raiſed Box, do it ſo well that no Bees may get out, but only through the additional Box, and ſo under the ledge of the door of the Bee-houſe, being the old place of the Bees entring into their Colony.

How,

CHAP. XIV.

How, and when to ſet under the third Box; which makes a perfect Colony.

IN ſetting under the third Box-Hive you are to obſerve the ſame directions as to the time when, and the manner how, as are before mentioned (and therefore needleſs here to repeat) in the 12th Chapter of this Section, concerning ſetting under the ſecond Box when the Straw-Hive is on: for the caſe is all one as to putting under the third Hive, whether a Straw-Hive or a Box-Hive is uppermoſt; which is by lifting them up both together, and placing them even upon this third Box with its ſliding ſhutter open, and ſtanding in the very ſame place, as the ſecond did, before it was ſo lifted up, and ſtopping up cloſe the open mouth of the middle Box, which open mouth will then be over the window of the third and loweſt box.

CHAP. XV.

How to take off the uppermoſt Hive, whether it be a Box-hive, or a Straw-hive.

HAving brought the method thus, to a perfect Colony, with three Hives, whether all three Box Hives or the uppermoſt of them a Straw-Hive, although the manner to take them off, and the directions to be obſerved therein, are all one, and the ſame, yet the Bees themſelves are more unwilling to leave the Straw Hive than a Box-Hive when it is uppermoſt, becauſe whilſt they have any Straw-Hive (being uſed to ſuch) they breed in it after their old manner when they lacked room, that is, with a larger circumference about (in proportion) then they do in Box-Hives where they have room enough, and therefore a Colony cannot be ſaid to be well ſetled untill it hath ſtood one year after the firſt uppermoſt Box Hive is taken off, when alſo a Straw-Hive hath been taken off before: and then it is paſt danger of miſcarrying if you order them rightly, according to the directions of this Book, and you may take a Box Hive off every year, if it be a good year and your Bees ſtanding but in an indifferent good place; except your ground be overſtocked with too great numbers of Colonies.

I ſhall now proceed to take them off, in which are to be obſerved four generall heads, which for more plainneſs I think beſt to ſet down in the form of ſeveral Chapters, becauſe they muſt be all very well conſidered before the Hive is to be taken off.

The firſt General Head to be obſerved before you take off the uppermoſt Hive.

WHether a Box-Hive or a Straw-Hive to be taken off, conſider firſt the ſtate of the Bees, which is to ſee that there be ſufficient maintenance, and Store of Honey left in the middle Box, for the ſubſiſtence of all the Bees, that they may have enough in the ſpring, and alwayes ſo much as to ſpare ſome (if need were) when Honey-gathering begins again; now to know this, obſerve, whether the middle Hive be full of Honey or not, which you may ſee through the glaſs windows before, or behind; and if the Combs reach to the bottom, ſo as to fill that middle Box-Hive, and the Combs againſt either or both windows be ſtopped up white, then you may proceed to take off the uppermoſt whether it be a Straw-Hive or a Box-Hive, and otherwiſe not, whatſoever Combs or Bees more or leſs are in the lower and nethermoſt Box. However, you may take off a Straw-hive in *June*, before Honey-gathering is paſt, though you ſee not the Honey at the windows of the middle Box, if there be any Combs in the nethermoſt Box, but not after the 10th of *July*.

The ſecond General Head to be obſerved before you take off the uppermoſt Hive.

THE time and ſeaſon of the year is very warily to be obſerved and underſtood becauſe of the King-Bee; Therefore I adviſe to take them off at ſuch a time of the year, wherein the time is paſt in which they are uſually diſpoſed to ſwarm, which in ſome years is ſooner, and in ſome years later; the moſt uſual time about twenty miles from *London* is in the beginning of *July*, and further off from *London* later in the year; but for one generall obſervation, where the harveſt is earlieſt ripe, their the Bees are ſooneſt fitted to have there Hives taken off; for, we ſee that the harveſt is ripe ſooner, neer *London*, than further off, ſometimes two or three weeks according to the ſeveral diſtances of the places from *London*. For if you take the upper Hive off in the heat of ſwarming time, you thereby provoke them to ſwarm, and if you take the upper Hive off after the King Bees are reduced to one, you thereby endanger the loſs of that one King-Bee. And if that one King Bee by any abſurdity commitred happen to be loſt or killed, then the certain deſtruction and loſs of the whole Colony will unavoidably follow, unleſs helped to nother King from another ſtock. To avoid which, and for the preſervation of the King-Bee, take the upper Hive off before they are reduced to one; and to know when that is,

take

take notice when the Bees kill their Drones, for then alſo do they kill all the ſuperfluous young King-Bees, and ſometimes ſooner, becauſe all is done by the order of that King which raigns, and this is done before the King retires into his winter quarters, and therefore take off your upper-Hive the firſt day as neer as you can that you ſee the Bees do but begin to beat away their Drones, and expell them to the lower parts of the Hive, as you may ſee them (ſometimes) lye, an handfull or two together in an heap upon the floor of the houſe, or upon the top of the lower Box, which is inſtead of a floor to the middle Box, then is the time for you to take off your upper-Box, although the Bees as yet do not kill their Drones.

But not to leave you in the dark when I come to deſcribe the manner of taking the Upper Hive off, then you ſhall know how to preſerve the King Bee, although there is but one left in the Colony, without which it were impoſſible for this Art to obtain its perfection; for thoſe who keep Bees in divers places cannot be juſt at the time with them all, eſpecially if they keep many, unleſs they made it their only buſineſs; therefore I ſhall diſcover how the Colony may be preſerved ſafe, though the time of the year be ſo far paſt that all the King-Bees are reduced to one; yet I conclude that the time above deſcribed is the beſt, becauſe I find it moſt agreeable to the nature of the Bees.

The

The third General head to be obſerved before you take off the uppermoſt Hive.

BEſides the time and ſeaſon of the year, the time of the day alſo when you take off the Upper-Hive, is to be obſerved, which I adviſe to be about three or four a clock in the afternoon; for if it be done in the morning or in the evening when all the Bees are at home, there are then alſo greater numbers in the upper-Hive as well as in the other, and the fewer Bees are in the upper-Hive, the better it is to be taken off; beſides, the Bees that come out of the upper-Hive (except in the day time) may be loſt; but the chiefeſt cauſe why I adviſe it to be done about three or four of the clock in the afternoon is, becauſe it is the moſt convenient time to put the Bees home again to their Colony, when they are taken out of the upper-Hive, eſpecially when there are great numbers, and when it is done ſo late in the year that there is but one King-Bee left, and he alſo is in that upper-Hive to be taken off, as it generally falls out when a Straw-Hive is uppermoſt if it be not done in *July*, or before.

The fourth general head to be obſerved before you take off the upper-Hive.

THE fourth head is moſt material, which is the manner how to take off the upper Hive, which if duely obſerved, will certainly preſerve

preſerve the King-Bee, although there is but one left in all the Colony (if you ſhould happen to ſtay ſo long, before you take it off as until all the young King-Bees are ſlain) which to do you muſt take notice where he is, and in which Hive of the three he abideth, at that inſtant wherein you intend to take off the upper-Hive. To know which, take the two directions or obſervations following, concerning the natures and breed of the Bees. The firſt direction or obſervation concerning the natures of the Bees themſelves, thus: by natural inſtinct all King-Bees whatſoever in all Colonies and Straw-Hives, upon any noiſe or diſturbance in, or about the Hive, do aſcend upwards, and to as high a place of the Hive as poſſibly they can, becauſe the crown or top of the Hive is their throne and place of command, and chiefeſt power; (for if you put two or three King-Bees into a ſwarm, that ſame King-Bee which obtains the higheſt place in the Hive, cauſes the other to be expelled) this is certain: for as a General upon an alarm repairs to the head quarters of his army, where the Colonels and Captains meet him to know his orders; ſo to the King-Bee then in the uppermoſt part of the Hive, do repair the chiefeſt force of the Honey-Bees, as it were coming for orders, but at the ſame time the cowardly Drones ſneak into the lower corners of the Hive. And therefore upon this conſideration, although the King-Bee is in the middle Box, yet upon the leaſt noiſe by talking, or or otherwiſe in your approaching to the Colony, he haſtens up into the upper-

Box

Box, and alſo the ſtrongeſt Bees with him preſs up immediately thither alſo. This I think is caution enough for you to make no noiſe, ſo much as by talking or ſpeaking, untill the ſliding ſhutter is driven cloſe home.

The ſecond direction or obſervation is, concerning the places of their breeding, or in which parts of the Hive the Bees do breed their young, about and among which the King-Bee is alwayes converſant (except in caſe of alarm and diſturbance) which is thus ; the brood of young Bees in the Colonies, when they occupy three Boxes, reacheth from the lower third part of the uppermoſt, down quite through the middle Box, and a little way into the loweſt Box, and that in the loweſt Box is more or leſs according to the richneſs of the Colony : if very well to paſs, then there is the leſs brood in the upper-Box, and the more in the loweſt, but the middle Box is alwayes full, I mean in the middle or central part of the Hive (for their Honey is in the circumference) from the hole at the top where the ſliding ſhutter is, reaching down to the bottom where it meets the hole and ſhutter in the top of the loweſt Box. The length of their young brood is commonly fifteen inches, the thickneſs five inches, and (being round) the compaſs or circumference of it is fifteen inches ; it is ſeldom bigger or leſſer, or longer than I have deſcribed it : much like to a Tobacco-roll ſtanding upright of that length and bigneſs, and all the other parts of the Hives round about this breeding place is filled with Honey according to their ſtore.

The

The Colony being in this condition, and ſeeing the King-Bee is the only male without whom they cannot breed (as before I have proved) then conſequently he muſt be ſometimes in the upper, and ſometimes in the lower, but generally in the middle Box where their Brood is moſt.

Having conſidered theſe obſervations, to know where the King-Bee is, muſt be by comparing the upper with the lower Box; for if the middle Box be full, and the lower Box hath Combs in it, then obſerve, as far as the brood of young is ſuppoſed to be in the under or nethermoſt Box, ſo far below the middle or central part of the uppermoſt Box-Hive is the uppermoſt part of the ſame Brood of young, the Boxes being ten inches high, and ſtill remembring to except the caſe of diſturbance by noiſe or motion, you may more than probably conjecture, where the King-Bee is: he being generally in or about the middle of that Brood of young all the while any Bees are to be bred. Therefore the upper Hive ſhould be taken off before breeding is paſt.

In order to take off the upper-Hive, get all your inſtruments in a readineſs: which are, a fit inſtrument of Wood or Iron to drive the ſliding ſhutter in the top of the middle Box cloſe and home with an hatcheth or hammer. A little Lome or Mortar in caſe there need any to ſtop the hole that the Bees may not aſcend up out of the middle Box if the ſhuter be not driven cloſe and home; a knife to cut the Combs away where the ſhutter is,

if

if need be, to make it go home; a linnen cloth about two or three foot broad, and about five foot long; a little ſtick or two about half a yard long, and as big as a broom-ſtick, and an empty Hive, a Straw-Hive, when you take a Straw-Hive off, and a Box-Hive when you take a Box-Hive off; having all theſe in readineſs, proceed to take off the upper-Hive in this manner. Without any noiſe by ſpeaking or buſtling, about three or four of the clock in the afternoon approach your Colony at the backdoor of your houſe, and the firſt thing you do, with an heavy hammer or hatchet drive cloſe home the ſhutter that is next under that Hive you intend to take off; do this firſt to prevent the aſcending up of the King-Bee and as ſoon as this is done which muſt be very dextrouſly, then as nimbly as you can lift up the uppermoſt Hive, and ſee if the ſliding ſhutter be ſo cloſe that not a Bee can get up out of the middle Box, and if the Combs hinder, cut them away with your knife, and if not yet cloſe enough, ſtop it with Lome or mortar, then ſet the uppermoſt Hive on as it was before, only tilted up a little, about an inch or two with a ſtick, or any thing, and let it ſtand thus about an hour; all this time not opening the foredoor at all; and whilſt you are at your work, take care that you move not the loweſt Box from the ledge under the front-door, leſt the Bees get into the houſe that way: then ſhut the back-doors to make it dark in the Bee-Houſe for that hour, in which time you may gueſs whether the

the King-Bee is in the upper-Hive which you took off or in the middle Hive, being the uppermoſt of thoſe two you left unmoved in their places. For, if the King Bee is in the upper-Hive thus ſeparated, the Bees in that Hive will be quiet without any murmuring noiſe; but if the King-Bee is not in the upper-Hive ſo ſeparated, then the Bees will murmur, and many of them will be creeping away: ſo if the King Bee is in the middle Hive, being the uppermoſt of thoſe two left ſtill in their places, then the Bees in thoſe two Hives will be quiet, and follow their work, and make no diſcontented murmuring noiſe; and conſequently if he be not in the middle Hive, the Bees there will be very unquiet, and diſcontented.

The reaſon why I direct to leave the houſe dark for an hour, is becauſe the Bees in the uppermoſt-Hive being thus diſplaced and diſturbed, will ſeek for their King, and whether they find him or not, being in the dark, they will fill themſelves with their own Hony, and in that time they will be the better prepared to leave their Hive afterwards. When the hour is expired, then your next work is to take the uppermoſt Hive quite off, and carry it away to get out the Bees that are therein; for there will be ſome, more or leſs, according to your dexterity in doing your work in ſhutting the ſhutter cloſe; but many or few, the way to get them out is thus.

CHAP.

CHAP. XVI.

How to gett the Bees out of the uppermoſt Hive taken off, and how to put them to their Colony again.

HAving an empty Hive ready, as before directed, carry your Hive taken off the Colony four or five yards diſtance from the Bee-houſe, to take the Bees out of it there, rather than cloſe to the Bee-houſe, leſt you diſturb the other Bees: place your Box-Hive on a joynt-ſtool with the leggs upwards, and place the Box Hive thereon with the top downwards, and if it be a Straw-Hive place it in a bucket or pail with the top downwards, let either of them ſtand, or be held faſt, and ſo ſet turned up that you may ſee all the combs, then having the full Hive ſo placed, whelm or cover it hollow over with your prepared empty Hive ſo that all the Bees may creep up thereinto, then make or cauſe the Bees to aſcend up into the upper Hive thus: ſtrike only the under Hive which was taken off the Colony with the ſtick before ſpoken of to be ready, beating that Hive lightly; for, with the little ſhaking of the blows, and conſtant noiſe of knocking, which muſt be done by going round as a Cooper when he driveth an hoop on a tub; and if it be a box-Hive knock it in like manner ſometimes underneath, the better to drive the Bees up, then within one hour or thereabouts if you ſtill keep beating the Hive, the Bees will all aſcend

aſcend up into the upper empty Hive by degrees crawling up, and in their aſcending you will hear their humming noiſe greater or leſſer according to their numbers, and all, except perhaps a few Drones, and here and there a ſtragling Bee, will be aſcended up into the empty Hive: but if there be any creviſe whereby any Bees can creep out betwixt the Hives, then ſtop them cloſe in by tying the linnen cloth (before directed to be gotten ready) cloſe round about, for if any Bees can creep out any where whilſt you knock the under Hive with your ſtick, then the reſt will not eaſily aſcend, which cloth will ſeldom be wanted for this uſe when the Straw-Hive is gone. becauſe the Box-Hives are even, and ſo the Bees cannot creep out betwixt them, but at the mouths of them which muſt then be ſtopped. But obſerve in your driving up the Bees in this manner that you neither ſhake nor ſtrike the upper empty Hive, but only the under full Hive, which was taken off the Colony, for in ſo doing you will cauſe the Bees already aſcended to fall down again, and ſo cauſe your ſelf double labour.

Having thus gotten the Bees into the upper empty Hive; although it ſhould ſo happen that through negligence or want of time you have tarryed untill ſo late a time of the year as until all the King Bees are reduced to but one and that one King-Bee ſhould alſo be in the uppermoſt Hive when taken off the Colony, yet will he be gone up into this empty upper-Hive with the other Bees, being driven on this manner.

When the Bees are thus in the empty Hive, then take off the linnen cloth tyed round the Hives, and ſo take them from off their full Box or Hive, and immediately ſend your Honey within doors for your uſe, that other Bees by the ſmell of it may not be brought to it, and as quickly as you can ſpread the linnen cloth before the mouth of the Colony from whence you took the Hive off, and with two nails faſten one end of the cloth ſmoothly before and on both ſides of the Bees alighting place before the Bee-Houſe, and ſo cloſe, that the Bees may creep off the cloth into their own Colony at the mouth, and let the cloth hang down ſmooth and ſloping to, and upon the ground its whole length from the mouth of the colony, ſtill remembring all the time from the beginning of your work, not to open the fore doors of the Bee-Houſe, but keep them cloſe ſhut. Then at once with a ſmart blow on the outſide of the Hive knock all the Bees out of the empty Hive upon the cloth where it is. ſloping, and if all the Bees are not clean knocked out of the Hive, then give it a violent knock by ſtriking the edges of the Hive upon the cloth where it lyes on firm ground to get the Bees clean out upon the cloth, then you will ſee that all the Bees will croud up like ſheep into a fold, and without taking wing, creep up to the mouth of their own Colony, and ſo in unto their fellows rejoycing that they are at home, and the King-Bee alſo if he be among them, for this is the only time of ſeeing the King-Bee; therefore do it in the day time, and not late

in

in the evening, for then alſo the Bees that get looſe may find their way to their own home. And if this be done as I have directed ſo that all the Bees may be at home being gone up off the cloth into the Colony, and the cloth taken away, about two hours before Sun ſetting, then you may certainly know whether the King-Bee is among them or not if you did not ſee him upon the cloth (as ſometimes you may) among the other Bees; for in one quarter of an hour after the Bees are all at home, if the King-Bee is with them, then the Bees will be ſtill and quiet, and keep in their Colony without running up and down about the mouth or murmuring noiſe; but on the contrary, if the King-Bee is not among them, then the Bees will run to and fro about the mouth of the Colony as if they were diſtracted, and in the Colony they will have a conſtant murmuring noiſe; and many of them will fly abroad and about in ſearch for him, which if they then do, you may be ſure their King is not among them.

Then if it be ſo, look well into the Hive taken off and carryed within doors, perhaps he may be there, as ſometimes he is, if it be a ſtraw-Hive taken off, and an old ſtock when your Colony was firſt furniſhed with him: but I never found it ſo when I took off a Box-Hive, and very ſeldome when I took off a Straw-Hive, and then I obſerved that the Combs in ſuch Straw-Hives were very old, but when it is ſo, for remedy take your Combs out of the Hive carefully by degrees though you break them, and lay them out in

pans, and neer the top or crown of the Straw-Hive you may find the King-Bee among the Combs, then take him, and carry him to his Colony putting him in at the mouth, and in two minutes you will see a wonderfull change in the actions of the Bees, changing their mournings to rejoycings, the consequence of which will be, that the Bees will chearfully follow their labours as before you took their Honey away.

Thus you have your uppermost Hive with Hony taken safely off your Colony without the destruction or killing of the Bees themselves, who will labour to requite your pity to them in sparing their lives by working the more vigorously for you the next Summer in order to spare you some more of the fruits of their labours in way of thankfulness in the like manner, if the unkindness of the year do not hinder their earnest industry: for those Bees whose lives are spared having passed the accidental and personal miscarriages of the Summer past, and passing the winter in rest, will vigorously, and early in the spring begin their working again.

But here I give you to know that by my own experience and others, when the uppermost Hive is a Box Hive, then the King-Bee is more certainly in the middle-Box, and therefore the Bees are more willing to part with, and go out of a Box Hive when taken off than a Straw-Hive The King Bee also when they are rid of the Straw Hive and reduced only to the way of Colonies, is preserved with less trouble, and more certainty, especially if

if you take them at the time and ſeaſon before directed; for as one among five or ſix is more probable to eſcape when danger comes than one alone is, and it being alwayes ſafer to prevent than overcome dangers (*Venienti occurite morbo*, that is, meet a diſeaſe coming) ſo it is beſt not to delay too long, although you have a remedy, and know how to preſerve your Colony.

Having reduced your Colony in the houſe to two Hives only, by the taking off the uppermoſt, obſerve afterwards for two or three days whether the Bees work or not, for if they carry in generative matter, you may be ſure that the King-Bee is in ſafety, for without him they cannot breed, and without him they will not work.

Alſo if they kill their Drones after the upper Hive is taken off you may be ſure their King is ſafe, becauſe they kill their Drones by his orders, for if he be not among them to give thoſe orders they kill them not. But if you ſhould by obſerving find that your Colony works not, nor kills their Drones, and ſo doubt their King to be loſt, then you may furniſh your Colony with a King-Bee from ſome poor ſtock or caſt to be taken up, which time is then coming on, and neer: and if thus you put to them a King-Bee when yet their own King-Bee is ſafe, then that King ſo put to them will be expelled by the Bees, otherwiſe they will receive him for their King.

CHAP. XVII.

How to order the Colony after the upper Hive is taken off: or if you take not the upper Hive off.

WHen your Colony is reduced to two Boxes, or Box Hives only (the Straw-Hive being once gone, is never after to be uſed again) then proceed to order them as followeth; at the begining or towards the middle of *Auguſt* according as the year is good or bad for robbing, and forward or backward: inſpect your Colony, and obſerve what numbers of Bees are in the loweſt Box, and whether they continue therein or not, for as the weather grows colder and colder, the Bees will aſcend upwards into the upper-Hive of the Colony and lie cloſer and cloſer together, and as ſoon as you find by looking in at the windows that almoſt all the Bees are gone up out of the under Box, ſo as to lodge in the upper Box, then although that under Box be half full with Combs, or whether there be any Combs in it or not, yet if there be almoſt no Bees in it (beſides a few that watch) in the evenings and in the mornings, then take it away from under the Colony and ſet the upper Box on the floor again, and in taking the Colony off the under Box, if the Combs that were in the paſſage break ſo that they hang down lower than the other parts of the Combs in the Colony (as ſometimes they do) then cut them off even with a knife becauſe they ſhould not be bruiſed and bended when the

Box

Box ſtands on the floor, and after thoſe Combs are cut off even with the reſt, ſet the Colony down on the floor in the ſingle Box, withal remember to open their mouth that they may have breath and paſſage out and in under and through the ledge of the houſe door, to which ledge they muſt be ſet cloſe. But if any ſtore of Bees beſides thoſe that watch do ſtill remain in the under Box, in the cold mornings and evenings, then let it ſtand under until the Bees are almoſt all gone up, unleſs you ſuſpect robbers: for if robbers ſhould trouble the Colony, then he muſt be ſet down the ſooner in his ſingle Box.

For, the ſetting the Colony thus low with a ſingle Box is not only a ſure defence againſt the cold and robbers; but alſo in the Spring following they will the ſooner fill that ſingle Box with Bees, and be the ſooner ready to be raiſed again according to my directions before given in the 13th. Chapter of this Section.

That lower Box which you take from under your Colony, you may reſerve clean, and dry all the winter with the Combs in it, to ſet the ſame again under your Colony in the Spring when you raiſe him again, you may alſo let all the Combs abide in it, if they are ſweet and clean, and free from Spiders, and webs, except the Drone-Combs, which I adviſe you to cut quite away with a knife. You may know the Drone-Combs which are ſeldom above two, by the bigneſs of the Comb and the largeneſs and depth of the Cells, from the other Cells of the Hony-Bees Combs.

When you have three Boxes one over ano-

ther, or if the uppermoſt Hive of your Colony is a Straw-Hive, and there is not ſufficient maintenance in the middle Box, ſo that you are not to take off the uppermoſt that year, as I mentioned in the firſt general head in the 15th. Chapter of this fourth Section, then in ſuch caſe remember to take away the nethermoſt Box-Hive in like manner as above and ſo leave the two uppermoſt Hives all the Winter, as you do the ſingle Box-Hive in the Bee-Houſe when the uppermoſt is taken off.

CHAP. XVIII.

How the Colonies may Swarm.

HAving ordered your Colonies thus; either left all the winter in a ſingle Box, or with two Hives, you have your choiſe when ſpring comes whether you will have an increaſe by ſwarming or not, for if you intend in the Spring to have your Colonies ſwarm, then forbear to raiſe them up by putting under a ſecond Box, then you need not doubt of a ſwarm; but after the ſecond Box is ſet under them perhaps they will ſwarm by your forbearing to put a third Box under them, and if ſo then you have your end anſwered; but that year in which you let your Colony ſwarm you muſt not expect to take off the uppermoſt Hive, and when you intend to have no ſwarm then raiſe the Colony according to the formentioned directions, and then you will have your profit by taking Hony.

Many

Many Colonies according to the year, and place they ſtand in will be ſo ſtrong as not to ſpare their nethermoſt Box in the fall, after their uppermoſt is taken off according to the time and manner before directed, then let ſuch a Colony ſtand to ſwarm.

When the Colony is reduced to Boxes only, ſo that you have your Colony occupying three Boxes in the Summer and yet have not (as ſometimes it will fall out in ſome places) ſufficient maintenance for the Bees in the middle Box, ſo that no Box is to be taken off, which happens commonly in very bad years, then having taken away the nethermoſt Box in the fall, as is directed in the foregoing Chapter, let ſuch a Colony thus with two Boxes ſtand the next Summer to ſwarm, for then you will have a large ſwarm, fit to furniſh a Colony withall, and perhaps to be raiſed upon another Box the ſame year.

CHAP. XIX.

Concerning the robbing of Bees: and how to prevent it

MAny perſons are of ſuch a bad diſpoſition, as to ſpeak evill of thoſe things whereof they are ignorant as appears by a falſe, jealous, and envious report which many who keep Bees only in Straw-Hives have raiſed in ſome Countries, which report is this, That where Bees are kept in Colonies no other Bees near them will thrive, becauſe ſay they,

they, Bees kept in Colonies will rob and ſpoil all other Bees that are kept neer them, and that they will and do, ſo rob and ſpoil them, is, becauſe they are neceſſitated to do it for their livelyhood; their Honey being taken away, and the Bees not killed.

To anſwer theſe jealous-headed perſons, if reaſon would ſatisfie them; the Bees in Colonies are ſo far from being neceſſitated to rob or ſteal from others by reaſon of want, that they have commonly left in them, after the upper-Hive is taken off, more Honey than a ſtrong ſtock kept in a Straw-Hive hath, though he hath not ſwarmed; Therefore let ſuch know, that when the Honey is taken from the Colony, the upper-*Box* only is taken from them, and at the ſame time there is ſuch ſtore of Honey left in the two lower *Boxes* as is ſufficient to maintain all the *Bees*; for if there were not Honey enough left for their maintenance and to ſpare, then either the Colony would dye, or become poor thereby, ſo that their owner would have the greateſt loſs, however they could not be in want until robbing time were paſt.

But it is rather their own poor ſtocks, and poor ſwarms, kept in Straw-Hives that are in the greateſt likelyhood of robbing and ſtealing out of neceſſity; for they are forced to take and kill ſuch although they have but a few ſpoonfulls of Hony in them, or elſe they leave ſuch to rob and ſteal, or be Starved in the Winter. What elſe can be the reaſon, that there is the greateſt robbing among Bees in very bad years for Honey-

gathering? but becauſe all ſtocks and ſwarms are generally ſo poor that ſcarce any, ſtocks or ſwarms can live untill the next ſummer, except only thoſe ſtocks which have not ſwarmed in the Summer preceding, as it happens in many places after ſome wet Summers; (for I have known an aged skilfull Bee maſter that had 60 ſtalls, and ſwarms of Bees, in ſuch a year take up 20 of them, only for to have their Hony to feed the other 40 withall) inſomuch that Bees in many places being ſenſible of their own poverty, have been led into Brew-houſes by the ſweet ſmell of the wort, where many Bees have Drowned themſelves; for I have known in ſeveral Country Towns where Bees have been kept, ſome perſons (whom I could name if need were) that have been brewing in the beginning of *Auguſt*, have been forced to ſtrain their wort from the Bees drowned therein. And in ſuch years there is generally the greateſt robbing among the Bees.

All Bees whatſoever (I mean Honey-Bees) whether kept in Straw-Hives, or in Colonies, are of ſuch natures (for the keeping of Bees in Colonies doth not change their natures) as to be ſenſible of their preſent poor ſtate, as well as of the ſucceding Winter, and they have ſuch knowledg as to be capable of deſpair in ſuch caſes, and then if Honey is not to be had abroad for gathering, they will get it any way, if it be to be had in any place, by right or by wrong, to maintain themſelves in the Winter; which makes them, if the weather will permit, go abroad to pilfer from, and rob other Bees;

and

and therefore in the fall chiefly each ſtock or Kingdom of Bees is ſo providentially careſull of their own wel-fare, that they keep good watch and ward at home, according to their ſeveral abilities, and kill every ſtrange Bee that they can catch.

For as ſoon as the Summer is ſo far ſpent, that Honey-gathering is paſt, then comes the time of robbing among the Bees, and then thoſe *Bees* diſpoſed to rob others, fly from one ſtock to another, and from one Colony to another, attempting to get in and ſteal Honey, though in danger of their lives thereby; and thus ſome Bees do every year, more or leſs, according to the goodneſs or badneſs of the year for plentifulneſs of Honey; for in very bad years they rob one another very much, but in good years they rob very little, ſo that ſcarce any Bees have been robbed, when the year hath yeilded much Honey; which ſhews that Bees knowing their poverty and lack of food, and alſo their ſtrength, which conſiſts in great numbers (for if they have but few Bees, they are not ſo able to fight, as to overcome and rob another ſtock) do grow deſperate; otherwiſe they would not ſo much endanger their own lives as wee ſee they do, in attempting to rob others, when they find that they have not a competent maintenance at home. Alſo all that keep Bees know, that in good years there are very few or no robberies committted among their *Bees*: The cauſe of which I judge to be, becauſe the *Bees* know when they have ſufficient to maintain them until the next Summer, and then they are not

not ſo deſperate as to endanger the loſs of their own lives, to get more with ſo much difficulty, danger, and injuſtice,

From which premiſſes I conclude, that rich ſtocks and Colonies well ordered, and well to paſs, ſeldom, or never, rob others; but thoſe only that are ſtrong in *Bees*, having great numbers, and little food, or ſcarce enough to maintain them, do grow deſperate from the ſenſe of it, and ſo make it their work to go about to ſteal and rob from others: and thoſe ſtocks or Colonies that have few *Bees*, are in moſt danger of being robbed. For the robbing *Bees* will go abroad whilſt warm weather permits, and going from one ſtock to another, and from one Colony to another, will endeavour in very ſmall parties to get in and pilfer, and where they find eaſy entrance, and ſmall reſiſtance, and can but carry away at three or four times, only ſo many bellies full of ſtolen Honey, then they will be ſure to come again and bring more of their fellows; and then if they get in, though but a fourth number of them eſcape to return home again laden with Hony to their fellows, yet they are ſure to return again & come with forces greater and greater until they overcome the Stock or Colony, out of which at firſt only two or three Bees had eſcaped with a little ſtollen Honey: and when they are overcome the true Bees will help the robbers to carry away their own Honey to their Hives: according to *Virgil Georg. lib.* 4.

——*Conſtructaque mella*
Diripuere ipſæ: et crates ſolvere ſavorem.

To

To prevent all kinds of robbing among your Bees take notice of the times of the year for robbing, as followeth.

All the Summer whilſt honey is plenty, and to be had abroad for gathering, then the Bees are juſt and honeſt, and will not rob others, ſo that if the next Colony or Hive were full of Honey, and no Bees in it, they would not go to take it, unleſs they were ſhewed the way, or ſome Bees ſhould find it to be ſo by chance by going into the Hive through a miſtake, or the Combs broken ſo as to make the Hony in them ſmell ſtronger than uſual.

In the Winter the Bees are ſo ſoon chilled with cold, that they cannot go abroad, therefore robbing times are only Spring and Fall.

In the Spring Bees are not ſo ſtrong as in the Fall, therefore robbing is moſt, and more ſtrongly carried on in the Fall, than in the Spring: beſides, moſt of thoſe Stocks which would have robbed others in the fall, are themſelves dead and ſtarved for want of food before the Spring is ſo far come on as to rob.

Take notice alſo that a *vacuum* or empty ſpace between the body of the Bees and the mouth of the Hive in robbing time, is a great temptation to the robbers as it were inviting them to come by the advantage they have of hiding themſelves for ſome ſpace of time in that *vacuum*, and by abiding there they begin to ſmell like the true Bees, whereby they avoid the purſuit of, and are not ſo ſoon found out by the true Bees; thus the robbers have the greater opportunity to pilfer; and when once

once a few robbing Bees have gotten their booty, *viz.* A belly-full of Hony and eſcape to their own Hives with it, then that Colony or Stock out of which the robbers did but pilfer, is in very great danger of being robbed.

To prevent this kind of robbing, I have ordered the lower Box of the Colony to be taken away, in the manner deſcribed before in the 17th. Chapter of this Section.

Another cauſe of robbing is when there be divers paſſages out and into the Colony or Hive, or if any Bees can get out and in under the Box or Hive by reaſon of the unevenneſs of the floor, or through any other place beſides the common ſingle mouth; theſe paſſages much endanger robbing, becauſe the robbing Bees and Spies by them get acceſs into the Hive or Colony uneſpied by thoſe that watch.

To prevent this kind of robbing I have in my directions in divers places ordered all avenues and holes about the Hive or Colony where a Bee can get out or in, to be alwaies cloſe ſtopped up, except only their mouth paſſage.

Another great cauſe of robbing is a large entrance into the Colony at the mouth in robbing time, which is a great diſadvantage to the Colony, and ſo alſo to a Stock, becauſe then is required the greater numbers of Bees to defend it, whereby the Colony *Bees* are wearied and tired out with much watching; alſo you may obſerve that the robbing *Bees* will be ſooner abroad in the morning about their evill intentions then commonly other

Bees

Bees go abroad at that time of the year, and comming to a Colony or *Hive* ſo early in a morning, they eaſily get by the guard, if the paſſage be not ſo narrow that a centinel might guard it.

You may know robbing time when it begins by the approaching of ſeveral *Bees* that attempt to go into a Colony or *Hive* of *Bees*, but dare not, flying, and hovering about the mouth of it, and making many offers to get in, untill for their boldneſs, ſome are caught by the Bees of the Colony, and ſuffer Death for it, and others by the example of their fellows ſufferings fly away to the next *Hive* or Colony to try their fortunes there alſo, where if they meet with a ſtrong guard they retire, and come no more. Thus in ſome years almoſt every Stock and Colony is tried by the robbing *Bees*.

To prevent this and all other kinds of robbings as well as other abſurdities in ordering your *Bees*, beſides what hath been already hinted, the laſt and chiefeſt help to prevent robbing is duely to keep the door or paſſage of your *Bees* ſhut or ſtopt up, all the year according to the ſeaſon; for the cauſes why ſo many Stocks of *Bees*, and Colonies are robbed in bad years, next to the poverty and ſtrength of the robbing *Bees* is, the neglect of ſtopping them up ſoon enough in the fall, according as I have known many who would not ſtop up their *Bees* (becauſe they thought the *Bees* did ſtill gather *Honey*) thereby to prevent the coming of robbers to them, untill they ſaw their *Bees* infeſted with the robbers

robbers: which was much like to him that ſhut the Stable door, as ſoon as the horſe was ſtolen out; for when once the Bees are much troubled with the robbers: if thy die not, nor are robbed, yet they are much weakned by them.

The beſt way therefore is to ſtop them up thus: as ſoon as hony gathering is paſt (which is ſooner or later according to the year) which any man may know by the *Bees* beginning to beat their Drones away,& by the *Bees* leaving to work apace, then although in *July*, yet narrow their paſſage to half an inch or an inch according to the ſtrength of your *Bees*: and in the begining of *Auguſt* norrow their paſſage to half an inch ſquare, and let it ſtand ſo untill the cold weather, and then make it ſomewhat leſs according to the ſtrength of your *Bees*: for the *Bees* muſt alwaies have ſome air, then leave them ſo all the winter, and in *February* open the paſſage again to halfe an inch ſquare till *March* is almoſt out, and then, or ſooner if the year be forward and your Bees ſtrong, make their paſſage an inch in length, and ſo let it ſtand untill the end of *April*, or thereabouts, and then according to the ſtrength of your Bees you may make their paſſage wider and wider to its full length, that the Bees worke might not be hindred, and as ſoon as ſwarming time is fully paſt narrow their paſſage a little, untill Honey gathering is fully paſt, and the Bees begin to leave working apace again then make their paſſage an inch again, and ſo on, to half and inch,&c.

Obſerve in generall that ſome years are much

much more forward than others, and in ſome places the ſpring is two or three weeks forwarder than it is in other places; therefore ſome diſcretion muſt be uſed as to the time certain when to ſtop up, and open the paſſages of your Bees, for we ſee that ſpring and harveſt are generally ſooner near *London* than further off.

But if you perceive your Colonies or Straw-Hives, at any time infeſted, and viſited by the robbers, with greater numbers than three or four, or with more than the true Bees can very well conquer and puniſh, your only way is, immediately to ſtop their paſſage up cloſe with pieces of Tobacco-pipes, or with a Comb, or any thing through which the Bees may have air, and not be ſmothered: and at night; after Sun-ſetting, open the paſſage again, and ſo let out all the Bees that will go out; for no Bees but robbers will then fly away: and when the Bees are ſtill and quiet within, and the robbers all gone, which will be in a quarter of an hour, then ſtop them up cloſe again, as before, ſo that not a Bee can get out nor in, and keep it ſo cloſe ſtopt for three daies, and afterwards open it a little only at noon, to give the Bees liberty for about four hours only in a day, becauſe of their danger; and when one Hive or Colony is ſo ſtopt up, look well to the next Hive or Colony that ſtands by him, to ſtop him up cloſer than ordinary, or quite cloſe in like manner: for the robbers will vigorouſly aſſault all thoſe ſtocks or Colonies which ſtand neer to ſuch as they are prevented to rob.

CHAP. XX.

Of the diſeaſes of Bees, and their remedies.

THE only diſeaſe which I yet know incident to Bees (which I can properly term a diſeaſe) is a laſk or flux, which we may ſee by their evacuating their excrement thinner than uſual, with which the Bees grow weak, and ſoon dye, which happens moſt in warm winter weather, and early in the ſpring, when they fly abroad; the cauſe of which is, becauſe they can have no vegetables whereof they can gather phyſical food to help themſelves. The remedy of this diſeaſe is to give the Bees ſome ſalt and Honey mixed with meal and water, or ſalt and Honey mixed alone, and ſo let the Bees eat thereof, it will help them; and theſe things alſo will prevent the diſeaſe, being given before.

But there are ſeveral other occaſions of their ruin, as fighting, cold and hunger, want of air, and the loſs of their King-Bee, beſides various accidents happening to ſingle Bees abroad at their works, by winds and rain, by which they are often beaten down, and then ſoon chilled and killed, eſpecially in bad weather in the Spring, and are often met with by their enemies, as Birds on the Trees, and Poultry, &c. The beſt remedies of theſe occaſions of ruine to the Bees, I ſhall here lay down in order.

Their fighting is prevented by the Houſe

right made, as in *Chap.* the 2d. of this *Section*, and by keeping the doors duely ſhut as in *Chap.* the 5th. of this *Section*, and by having their paſſage kept duly ſtopt up, according to to the directions in the foregoing *Chap.* concerning robbing.

Their cold and hunger is prevented, by keeping the houſe cloſe, and by putting a little Straw on them in the very cold weather, and by leaving them food ſufficient, according to the directions in the 15th. *Chap* of this *Section*, and feeding them, if you have not left them food enough; for having great numbers of Bees, and it proving bad weather in the Spring, they may ſoon come to want, and for remedy when it is thus, draw back the ſliding ſhutter on the top, and put in ſome Honey mixed with a little Salt, and you will then wonder to ſee what great incouragement the Bees will receive thereby, and how briskly they will work after it, and if good weather ſucceeds, want no more; I ſhall ſpeak ſomething more of their cold and hunger in the next *Chapter.*

Their want of aire in the Hive, beſides the danger of ſmothering them, occaſions the Combs where there is any moiſture to grow mouldy, and breed vermin, unleſs juſt where their globulous body is, & conſequently makes them loathſome to the Bees, as well in Summer as in Winter; the remedy of which is to give them ſome aire at all times according to the ſeaſon.

Concerning the loſs of their King-Bee I have ſufficiently treated in the 2d. Chapter of the

2d. Sect.

2d. Section, the remedy of which is to ſupply them with another; but to prevent his loſs obſerve the directions in the 15th. and 19th. Chapters of this ſection.

Thoſe various accidents that befall ſingle Bees, can no waves by art be remedied, therefore your beſt courſe is to preſerve your Colonies with as great numbers of Bees as is poſſible, for then the whole Colony will be the better able to bear thoſe particular loſſes.

The Bees in Colonies are better preſerved from ſeveral of their enemies than they can be in Straw-Hives, as from mice, birds, moths, &c: from mice thus: whereas mice breed under the hackle, and gnaw an hole ſometimes into an Hive of Bees, they cannot eate, through a wooden Box Hive, nor ſo eaſily enter in at the mouth, though not ſtopped at all, as they ſometimes do into the Straw-Hives though ſtopped, if the lome be not very well mixed, or covered with aſhes: From birds thus, whereas divers ſorts of birds as ſparrowes, titmice, and others, do often come to the mouth of a ſtraw Hive, and peck at it, whereby they cauſe the Bees to come out in cold weather and ſo eat them one by one as they come forth: Thoſe birds cannot come to the Box Hive to peck at it, when the houſe doors are duly kept ſhut, and though they peck at the door, yet the Bees within the Hive by reaſon of the diſtance are not (at that time of the year) diſturbed, and conſequently are not enticed out by that noiſe the birds make in pecking.

Moths generally harbour and are bred in hackles, of which there is no occaſion in this method of Colonies, and though ſometimes a ſort of Maggots or Wormes which turn to Moths, are bred among the Combs in ſome weak Stocks, yet I never knew any in a ſtrong Stock or Colony.

And Spiders, Emmets, Snails, and other Vermin which uſually annoy the Bees in Straw-Hives, are by the houſe, and Box-Hives well ordered, in this method much better kept off from being any trouble or annoyance to the Bees.

Any man that keeps Bees,and conſiders this method of ordering the Bees in Colonies, may reap ſome advantage, in knowing the better how to order them in Straw-Hives, untill ſuch time as he can attain to get an houſe and Box-Hives (right made) and Colonies; for the Bees natures are not changed, but their induſtry is much improved in this method of Colonies; as I ſhall now ſhew.

CHAP. XXI.

Of the Profit of Bees kept in Colonies, beyond what Profit can be reaped, from Bees kept only in Straw-Hives.

WHoſoever with diligence ſhall obſerve and follow the directions in this Book, he will find that he ſhall rarely miſs his deſired end both of delight and profit.

Delight; in ſeeing their curious works, and great induſtry, and in obſerving their admirable natures *&c.*

Profit; by the well thriving of his Bees, as many who have already taken my directions, have ſince experienced in having their expectations anſwered without the loſs of their Bees, and are willing to teſtify the ſame if need were.

As to the profit of Bees kept in Colonies I ſhall ſpeak the leſs, becauſe I can prove it in fact (as I have done in divers places already) therefore I ſhall only let you know that being kept in Colonies and well ordered (for without ordering them right you muſt not expect it) Bees do and will yield more than double the profit (when ſetled Colonies) than they are able to do, when kept in Straw-Hives; for beſides the juſtice of the thing, to ſave thoſe creatures alive (who ſpend their whole life in earneſt endeavours for the good of their kee-

pers by that mercy ſhewed to the Bees themſelves) their preſervation only, more than balances the peradventure of a ſwarm the next Summer, becauſe the Colony left is ſo much better than a Stock of Bees.

And paſſing over that ſmall advantage which is betwixt the conſtant attendance which Straw-Hives require in having one to watch when they will Swarm almoſt all the Summer, and the ſmall attendance that Colonies require, being now and then to look upon them.

The benefit of keeping them in Colonies if ordered right, according as I have directed in this Book, will ſhew its ſelf in the certainty of their preſervation againſt two of the chiefeſt and moſt conſiderable occaſions of the deſtruction of Bees, *viz.* cold and hunger, for whereas being kept in Straw-Hives they are ſubject to cold for want of numbers to keep them warm in Winter; and hunger for want of food to maintain them whereby they become deſperate, and turn robbers, and if they fail of robbing others, are ſtarved themſelves; now in this method of Colonies, they are wholly delivered from theſe two occaſions of their ruine, from cold; becauſe the Bees are all left, and ſo have their full numbers, whereby they keep one another the warmer in cold weather, and in the Spring; what elſe can be the reaſon that the Bees in *Ruſſia*, *Poland*, *New-England* &c. (where the weather is ſo extream cold in Winter) do live and thrive better than in *England*? but becauſe they are in greater numbers, and lying in a round

form

form and close body, keep out the cold from them, and the cause why they increase more and faster (in the spring and Summer in those Countries than in *England* (and consequently thrive better) is because both spring and Summer in those places are more serene and constant than with us.

From hunger; because they have food sufficient left them, and to spare, in the middle Box; if the owners themselves will but duely observe the directions in the 15th. Chapter of this section.

Besides what I have mentioned, the profit appears to be more than double both by reason and experience, thus: As three cords united by twisting together in one, are stronger than each cord alone is, and as three or four sticks bound close together are not so soon broken as each single stick alone is; so in a Colony the strength of a stock, a swarm and a cast are united together, whereby the Colony hath the strength of all; which strength consists in numbers, and being united they have more then a double advantage in working and gathering Honey, for whereas the strength of a stock is divided by sparing a swarm, their interests (by their interest I mean their growing strength by the Brood of young, as well as riches and present strength) doe thereby become different and separate, whilst the Colony Bees being undivided in their interests losing no time, doe follow and improve that their advantage by natural industry. which advantage of Colonies hath appeared to be treble in Honey-Dews by this

example

example following, which I can bring teſtimony of, to any that deſire it, by thoſe who ſaw it, upon the 21. day of *June* 1677, a Colony was weighed whoſe weight was juſt 55 pounds, and the ſame Colony was weighed againe upon the 28. day of the ſame *June*, and then the weight of the Colony was 85 pounds, ſo that in thoſe ſeven dayes the Colony gathered 30. pounds of Honey, which wee ſaw by the white plaiſtering upon the Combs at all the windows, and in the ſame ſpace of time a ſtock or ſwarm ſeldom can add above five or ſix pounds weight to themſelves.

The reaſon of which great advantage to the Colony is their being united, becauſe at ſuch a time the Colony having but one Brood of young-Bees, can ſpare all to work except their Drones which then keep their young Brood warm; but the ſtock and ſwarm having each of them a young Brood at home when the harveſt of Honey-Dews come, they being ſeparate, cannot ſpare half ſo many labourers in proportion as the Colony can and doth.

A ſtock cannot ſpare his proportion becauſe moſt go away with the ſwarm, and the ſwarm though he hath a competent ſtrength, yet many times hath not Combs in readineſs to put their Honey in, and when he hath ſome Combs, they are preſently ſo filled with the young Brood (which muſt be kept in a conſtant heat by the Bees) that they alſo cannot ſpare a proportion in number comparable to the Colony.

Moreover in bad weather the Colony Bees are not forced to go abroad as oftentimes

ſwarms are through want of Combs, &c. which I have known to that degree in wet weather, that a ſwarm hath loſt above half the number of his Bees.

Further, to ſhew that the profit of keeping Bees in Colonies is more than double the profit, of keeping them in Straw-Hives, only I ſhall now demonſtrate by compariſon, thus: If the Honey taken from a Colony in one year be more in quantity than the Honey taken from a ſtock and a ſwarm: and if the Colony left be as good and better than the Box taken off; then I doubt not but any man will grant with me the profit to be more than double, becauſe there is as much or more left then taken, and as much taken as a ſtock and ſwarm can make: for they being killed, there is an end of their profit, which profit is more than countervalued by the Box taken off the Colony: but the Colony left yields ſo much every year, and that is much better than the preſent profit; therefore the Colony left is better than the Box taken off.

That the Colony Box taken off contains more in quantity than the Honey taken from a ſtock and a ſwarm, is thus computed. If a Box taken off a Colonoy weighs 56 pounds (as the leaſt of all I ever yet took off weighed ſo much) and the weight of a ſtock be 28 pounds (moſt of them weighing much leſs) and the weight of a ſwarm be 28. pounds which is rarely exceeded (for a ſtock that hath not ſwarmed ſeldome exceeds 40 pounds) theſe compared are equall: the Colony Box being the ſame in weight, as are

both ſtock and ſwarm, ſome may think that the fine Honey in a ſwarm may be better than the Colony Honey: but when they come to compute the droſs, they will find that the Colony exceeds at leaſt a fourth or fifth part thus: the ſtock and ſwarm both weighing 56 pound, and the Colony Box weighing the ſame weight; there will be of good Honey at leaſt one fifth part more, produced out of the Box than out of both the Straw-Hives, by reaſon of droſs: for, the ſtock and the ſwarm have two Broods of young; but the Colony hath but one, which alſo is (the greater part of it in the middle Box, ſo that that part of the Colonies Brood of young which is in the Box taken off is not ſo large, as is the leaſt of the Broods of young either in the ſtock or ſwarm: beſides, there is more virgin Honey in one Colony than in three Straw-Hives (though two of them ſwarms) becauſe the Colony having room enough doth not put his honey into thoſe Cells, where they uſe to breed young as the Bees are forced to do in all Straw-Hives for lack of room, and ſo their Honey is courſer.

Moreover if the ſwarm be left ſtanding to balance the worth of the Colony left (which by much odds it cannot do) then the ſtock taken up will weigh much leſs than half the weight of the Colony taken off, beſides the goodneſs of the Honey in the Colony above that in the Straw-Hive.

But to ſatisfy all perſons that a Box-Hive taken off a Colony is ſo much as I have mentioned will appear by that which I preſented

to his Majeſty in *White-Hall* upon the 28th. of *Auguſt* 1677, which weighed above 64 pounds, and almoſt all was Hony, becauſe the Bees with their Brood of young; were gone down into the lower Boxes, ſo that there was more in quantity of Honey from that Box than three very good ſtocks that have ſwarmed will yield when the Bees are killed: that Colony with divers others in the ſame Bee Houſe being in very good caſe every year to yield the ſame profit, as I have by experience found, having ſince that time *viz.* The laſt year, taken off my Honey again, and expect to do the ſame again at the end of this Summer, and ſo onwards every year.

And therefore; to evince the continual profit of Colonies, I intend every year to keep one or more of my Box Hives which I yearly take off my Colonies the ſpace of ſeven or eight weeks (for much longer it will not keep good, becauſe of the young grubs in it) to be ſeen by any that will take but ſo much pains as to come to my houſe (as is mentioned page 73. of this Book) in the Bowling-ally at *Weſtminſter*.

I have this year already taken off my Colonies, and have reſerved two to be ſeen as above: the one weighing 61 pound, the other above 57 pound. Therefore if any man ſhall take other methods of ordering their Colonies, and neglect this: if they miſcarry, let them not be ſo injurious as to blame the Art.

Whatſoever perſons of Quality or Gentlemen

men deſire to ſee the delightful working of the Bees in the Colonies, and to ſet them up: for their further incouragement and inſtruction (beſides the furniſhing them with Box-Hives right made, and licences, and the example of ſome Bee Houſes as I mentioned in the advertiſement in the begining of this Book) I ſhall be ready whilſt I live to impart unto them, any experiences, or needful directions from time to time when they ſend to me, or I come to their houſes, though 50 or 60 Miles from *London*, if they deſire it, to direct them in ſetting up, and ordering their Colonies in this way of improving Bees, and taking their Honey without killing them.

To conclude, Whatſoever Gentlemen, or Bee-Maſter, who ſhall peruſe this hiſtory of Bees, and ſhall yet remain doubtfull (or be of another Judgment beſides, or contrary to what I have herein aſſerted) concerning any thing herein contained, or any thing elſe concerning the natures of Bees, or the practices of Bees whether kept in the old method of Straw-hives, or in this new & more excellent method of Colonies (being more excellent, not only becauſe more juſt, and more mercifull, but alſo becauſe it is a more delightful and more profitable method of keeping Bees) or concerning any other projects about them; I ſhall be ready and willing at any time to reſolve and ſatisfie them, and to communicate any other of my experiments concerning Bees unto them if they have recourſe to me by letters, or otherwiſe, at my dwelling

men-

mentioned in the preface. But becauſe no man can be perfect: and there is no art yet ſo perfectly known to any of the Sons of men, but may admit of further improvements; therefore I account not my ſelf infallible in this, yet ſhall but hope for further and better improvements of Bees: I ſhall therefore conclude with the words mentioned in the Title.

----Si quid noviſti rectius iſtis
Candidus imperti: ſi non, his utere mecum.

If any man, knows any thing, more true than I impart,
Let him diſcloſe it; otherwiſe, improve with me this Art.

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